THE PORT AUTHORITY OF NY & NJ

THE WORLD TRADE CENTER

ELECTRICAL/HVAC UPGRADE PROGRAM

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

CONTRACT NO. WTC-802.071

ASSISTANT DIRECTOR
WORLD TRADE DEPARTMENT

4-20-95
DATE

Sheet 1 Of 224

THE PORT AUTHORITY OF NY & NJ

CHIEF ENGINEER

ASS'T CHIEF ENGINEER FOR DESIGN

ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

TITLE
TITLE AND
APPROVAL SHEET

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.Galang	G.F.Farley	L.V.Galang
Designed by	Drawn by	Task Leader

Date 5/1/95 Scale

Contract Number WTC-802.071

Drawing Number T-1

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THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
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CHIEF ARCHITECT

Engineering Department
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Designed by	Drawn by	Task Leader
G.FARLEY	G.FARLEY	D.GALANG

Principal Architect

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ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

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G.FARLEY	G.FARLEY	D.GALANG

Principal Architect

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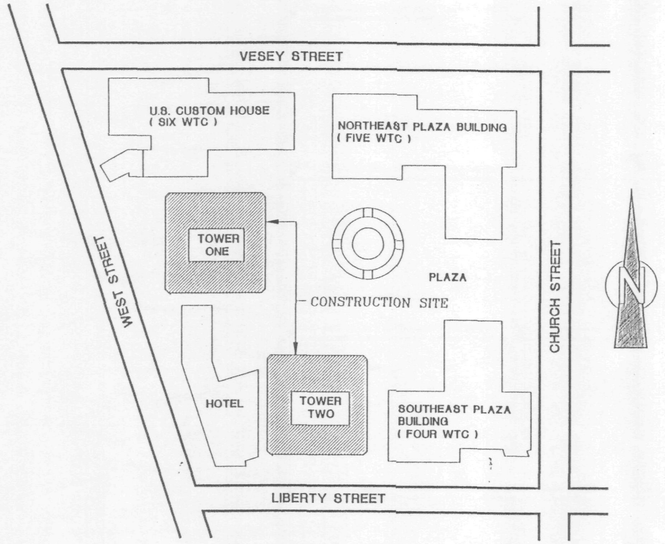
GENERAL NOTES

1. ALL WORK SHALL CONFORM AND COMPLY WITH NYC BUILDING CODE 27-348
2. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD. ANY ERRORS OR OMISSIONS SHALL BE BOUGHT TO ATTENTION OF THE ENGINEER.
3. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY AREAS WITHOUT FIREPROOFING. ALL EXPOSED STRUCTURAL STEEL AND CHIPPED-OFF FIREPROOFING SHALL BE PATCHED OR TOUCHED-UP WITH CAFCO TYPE D-C/F" OR APPROVED EQUAL, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE COMPENSATED FOR THIS WORK AT NET COST. SEE SECTION OF DIVISION #1 ENTITLED "NET COST WORK".
4. THE CONTRACTOR SHALL NOT DRILL HOLES INTO EXISTING SLABS OR STRUCTURAL MEMBERS FOR THE PURPOSE OF SUPPORTING ANY LOADS, UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER.
5. THE CONTRACTOR SHALL PROTECT, WITH DUSTPROOF PARTITIONS, THE PUBLIC OR TENANT SPACE BELOW FROM ANY DAMAGE RESULTING FROM FLOOR DRILLING OPERATION.
6. THE SPACE AROUND PIPES, DUCTS, ETC. PENETRATING FLOOR & WALLS, SHALL NOT EXCEED 1/2" AND SHALL BE PACKED SOLID WITH MINERAL WOOL OR APPROVED EQUAL AND BE CLOSED OFF BY CLOSE FITTING METAL ESCUTCHEONS ON BOTH SIDES OF THE PARTITION AS REQUIRED BY NYC BUILDING CODE 27-343
7. FIRESTOPPING SHALL BE AS REQUIRED BY NYC BUILDING CODE 27-345
8. MATERIALS INDICATED TO BE SALVAGED SHALL BE DELIVERED TO THE MATERIAL STORAGE AREA AS DIRECTED BY ENGINEER.
9. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN DRILLING THROUGH THE EXISTING CONCRETE SLAB, SO AS NOT TO DAMAGE THE RE-BAR REINFORCEMENT.
10. REFERENCE TOWER "A" IS ALSO TOWER ONE AND TOWER "B" IS ALSO TOWER TWO.

LOCATION PLAN



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ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

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Designed by	Drawn by	Task Leader

Principal Architect

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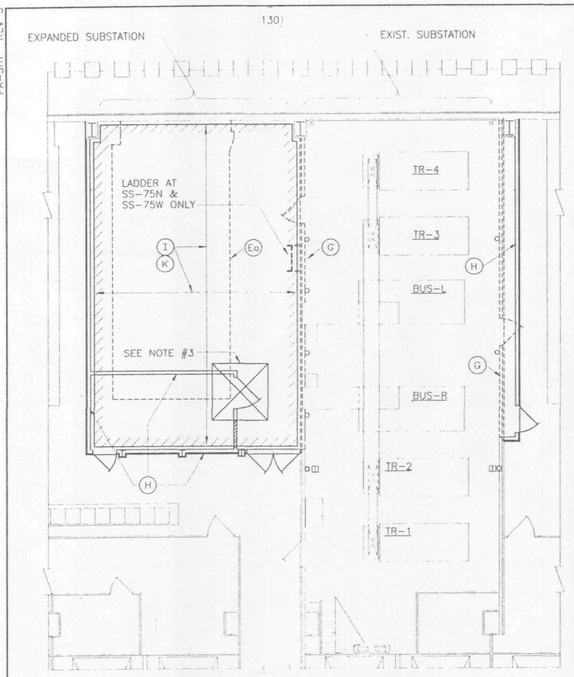
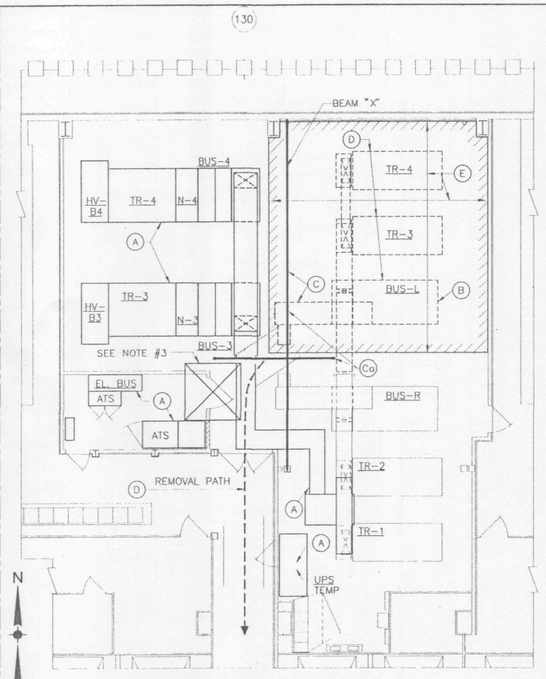
WTC-802.071 T-4

FILE NAME: 8030413.DWG SCALE FACTOR

PA-SHT REV 5



PLAN – 75th FLOOR SS-75N



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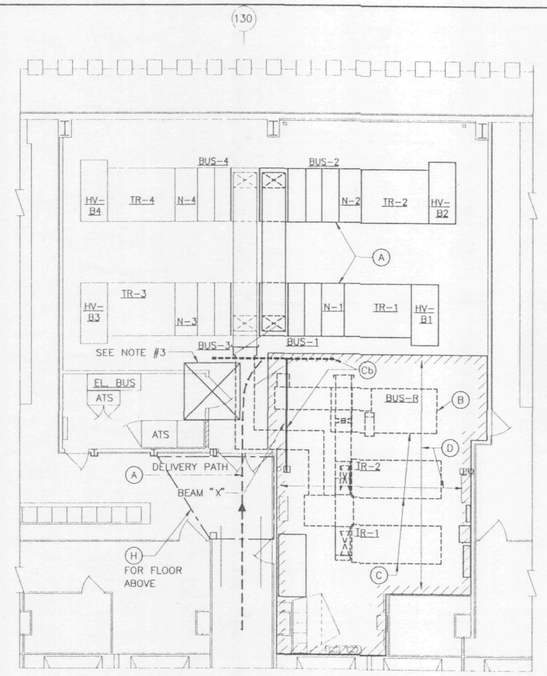
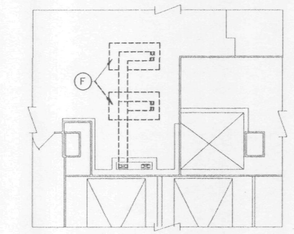
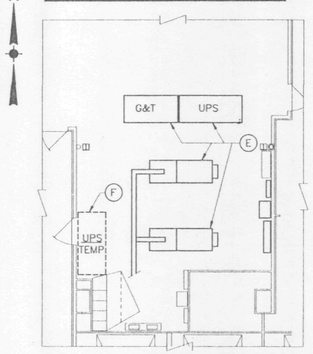


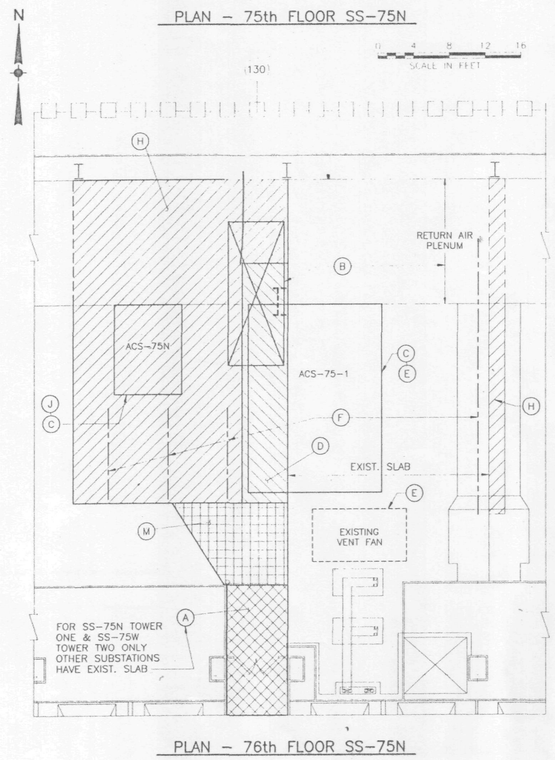
PLAN – 75th FLOOR SS-75N



PLAN – 76th FLOOR SS-75N



PLAN – 75th FLOOR SS-75N



PLAN – 76th FLOOR SS-75N

STAGE I

CONSTRUCT SUBSTATION ROOM

STAGE I STEPS – SEE NOTE #1 & 6

STEP	DESCRIPTION OF WORK
A	INSTALL SLAB FROM CORE CORRIDOR 76th FL TO SLAB ABOVE SUBSTATION
B	REMOVE OBSTACLES BLOCKING HVAC UNITS FROM BEING HOISTED UP TO ROOF OF EXISTING SUBSTATION
C	HOIST REPLACEMENT HVAC UNITS ACS-75-1 & ACS-75N UP TO ROOF (76th FL.)
D	CONSTRUCT SLAB EXTENSION No1 76th FLOOR SLAB FOR SUPPORT OF HVAC UNIT ACS-75-1.
E	INSTALL REPLACEMENT HVAC UNIT ACS-75-1.
Eq	REMOVE EXIST. UNIT FROM 75th FLOOR.
F	INSTALL ALL STEEL FOR ROOF SUPPORT. (EXCEPT BEAM "X")
G	REMOVE EXIST. SUBSTATION WALLS AS SHOWN
H	CONSTRUCT SLAB EXTENSION No. 2 76th FLOOR AND SUBSTATION WALLS, DOORS ETC.
I	RELOCATE EXIST ELEC. CONDUIT, WIRE AND EQUIPMENT OBSTRUCTING REPLACEMENT SWITCHGEAR INSTALLATION.
J	INSTALL REPLACEMENT HVAC UNIT ACS-75N AND REMOVE EXIST. FAN
K	INSTALL SECTION OF EPOXY FLOOR FOR STAGE II ELECTRICAL EQUIPMENT
L	INSTALL EMERGENCY POWER TRANSFORMER ROOM. (ONE ROOM FOR TWO SUBSTATIONS) SEE KEY PLAN.
M	INSTALL TEMPORARY PLATFORM FOR ACCESS TO CDTS. BELOW DURING STAGE II & III

STAGE II

INSTALL FIRST HALF OF SUBSTATION

STAGE II STEPS – SEE NOTE #1 & 5

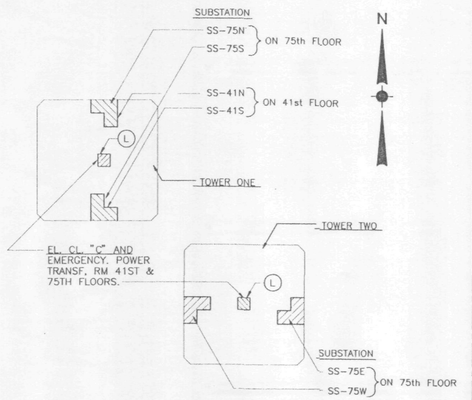
STEP	DESCRIPTION OF WORK
A	INSTALL FIRST HALF OF SWITCHGEAR & BUSWAY
B	TRANSFER LOADS FROM EXISTING SWITCHGEAR "L" BUS
C	REMOVE EXISTING TRANSFER SWITCH "ATS-L" AND INSTALL STEEL BEAM "X"
Cg	(SEE NOTE #2) FOR SS-75N & SS-75S ONLY
D	REMOVE FIRST HALF OF EXIST. SWITCHGEAR
E	INSTALL SECTION OF EPOXY FLOOR FOR STAGE III ELECTRICAL EQUIPMENT

STAGE III

INSTALL SECOND HALF OF SUBSTATION

STAGE III STEPS – SEE NOTE #1 & 5

STEP	DESCRIPTION OF WORK	STEP	DESCRIPTION OF WORK
A	INSTALL SECOND HALF OF SWITCHGEAR & BUSWAY	E	INSTALL SWITCHGEAR G&T, UPS AND 480-208/120V. TRANSFORMERS (2) COMPLETE WITH SECONDARY BREAKER AND BUSWAY
B	TRANSFER LOADS FROM EXISTING SWITCHGEAR "R" BUS	F	REMOVE EXIST. 480-208/120V. TRANSFORMERS (2) ON ROOF OF SUBSTATION AND UPS-TEMP
C	REMOVE SECOND HALF OF EXIST. SWITCHGEAR	G	PATCH ALL OPENINGS IN FLOORS WALLS ETC.
Cb	(SEE NOTE #2)	H	REMOVE TEMP. PLATFORM INSTALLED IN STAGE I AND CONSTRUCT SLAB EXTENSION No 3 76th FLOOR
D	INSTALL LAST SECTION OF EPOXY FLOOR		



KEY PLAN

N.T.S.

NOTES:

1. — a.–EACH SUBSTATION SHALL BE INSTALLED IN THREE STAGES AS FOLLOWS:
   - STAGE I – CONSTRUCT SUBSTATION ROOM
   - STAGE II – INSTALL FIRST HALF OF SWITCHGEAR
   - STAGE III – INSTALL SECOND HALF OF SWITCHGEAR

   b.–THIS DRAWING SHOWS BASIC STEPS FOR SUBSTATION SS-75N, OTHER SUBSTATIONS ARE SIMILAR.

   c.–FOR DETAILED STAGING SEE THE FOLLOWING:
   - DWG A-2 – ARCHITECTURAL
   - DWG S-3 – STRUCTURAL
   - DWG M-2 – MECHANICAL
   - DWG. P&S-1 – PLUMBING & SPRINKLER
   - DWG. E-4, E-5, & E-6 – ELECTRICAL

2. — AT SUBSTATION SS-75N & SS-75S, BEAM "X" SHALL BE INSTALLED IN TWO PARTS USING A TEMPORARY SUPPORT, FOR DETAIL SEE DWG. #S-3

   (Cg) INSTALLED IN STAGE II FORM NORTH WALL TO TEMPORARY SUPPORT.

   (Cb) INSTALL IN STAGE III FROM TEMPORARY SUPPORT RUNNING SOUTH, REMOVE TEMPORARY SUPPORT

   THE TEMPORARY SUPPORT SHALL BRIDGE SPACE BETWEEN NEWLY INSTALLED AND EXIST. SWITCHGEAR TO PROVIDE A PATH FOR REMOVAL OF EXIST. SWITCHGEAR – STAGE II (D) AND INSTALLATION OF STAGE III (A) SWITCHGEAR

3. — WALL AND DOOR SHALL NOT BE INSTALLED IN THIS AREA UNTIL THE FOLLOWING STEPS ARE COMPLETED:
   a – EXIST. SWGR. IS REMOVED IN STAGE II (D)
   b – REPLACEMENT IS DELIVERED AND PUT IN PLACE IN STAGE III (A)

4. — ALL FREE STANDING ELECTRICAL EQUIPMENT SHALL BE SECURED TO THE FLOOR AS RECOMMENDED BY THE MANUFACTURER AND AS SHOWN ON DWG. #A-34

5. — CRIBBING SHALL BE INSTALLED ON FLOOR & IN ELEVATORS, FOR INSTALLATION AND REMOVAL OF TRANSFORMER CORE & COILS, (SEE DWG #A-20 THRU A-27 & A-35)

6. — ASBESTOS SHALL BE ABATED PRIOR TO ANY WORK DONE AT THE CONSTRUCTION SITE.

Sheet 5 of 224

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ELECTRICAL ENGINEER

Engineering Department
Design Divisions

The World Trade Center
Electrical/HVAC Upgrade Program

Title

TOWER ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ELECTRICAL

CONSTRUCTION STAGING

CONFORMED

7/17/05

No. Date Revision Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

LEAHY/FISCHER Designed by | LEAHY Drawn by | A Checked by

Date 5-1-95 Scale

Contract Number WTC 802.071 Drawing Number CS-1

FILE NAME: 80271CS1 APR. 13, 1995

ABBREVIATIONS

A.C.	AIR CONDITIONER
A.DR.	ACCESS DOOR
A.F.F.	ABOVE FINISHED FLOOR
A.P.	ACCESS PANEL
ABV.	ABOVE
AC.T.	ACOUSTIC TILE
ADJ.	ADJUSTABLE OR ADJACENT
ALTER.	ALTERED, ALTERATION
ALUM.	ALUMINUM
ANG.	ANGLE
ANOD.	ANODIZED
APP.	APPROVED
APPROX.	APPROXIMATE
ARCH.	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
B.	BASE
B.L.	BUILDING LINE
BD.	BOARD
BKT.	BRACKET
BLDG.	BUILDING
BM.	BEAM
BOT.	BOTTOM
C.	COURSE:S
C.D.	CEILING DIFFUSER
C.H.	CEILING HEIGHT
C.JT.	CONSTRUCTION JOINT
C.L.	CENTERLINE
C.M.U.	CONCRETE MASONRY UNIT
C.R.	CEILING REGISTER
C.S.	CONCRETE SLAB
CAB.	CABINET
CEM.	CEMENT
CER.T.	CERAMIC TILE
CHAN.	CHANNEL
CLG./CEIL.	CEILING
CLOS.	CLOSET
COL.	COLUMN
CONC.	CONCRETE
COND.	CONDITIONS
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CONV.	CONVECTOR
CORR.	CORRUGATED
CPT.	CARPET
CSK.	COUNTERSINK:SUNK
CL.	CLEAR
CONDU.	CONDUIT
D.	DIAMETER
DO.	DITTO
DBL.	DOUBLE
DEMO.	DEMOLITION
DEPT.	DEPARTMENT
DET.	DETAIL
DIA.	DIAMETER
DIFF.	DIFFUSER
DIM.	DIMENSION
DN.	DOWN
DPL.	DUPLEX
DR.	DOOR
DRN.	DRAIN
DWG.	DRAWING
E.	EAST
E.F.	EACH FACE
E.W.C.	ELECTRIC WATER COOLER
EA.	EACH
EL./ELEV.	ELEVATION
ELEC.	ELECTRICAL
EMERG.	EMERGENCY
ENCL.	ENCLOSURE
EQ.	EQUAL
EQ.SP.	EQUAL SPACES
EQUIP.	EQUIPMENT
ETC.	ETCETERA
EXT.	EXTERIOR
EXIST.	EXISTING
EXP.JT.	EXPANSION JOINT
EXPN.	EXPANSION
EXTN.	EXTENSION
ELEC./CL.	ELECTRIC CLOSET
ELEV.	ELEVATOR
F.A.	FRESH AIR
F.D.	FLOOR DRAIN
F.F.	FAR FACE
F.H.C.	FIRE HOSE CABINET
F.H.R.	FIRE HOSE RACK
F.O.	FACE OF, FINISHED OPENING
F.P.	FIRE PROOFING
F.S.	FAR SIDE
FDN.	FOUNDATION
FIN.	FINISHED
FIXT.	FIXTURE
FL.	FLUSH
FLR.	FLOOR
FLT.HD.	FLAT HEAD
FR.	FRAME
FT.	FEET:FOOT
FTG.	FOOTING
FURN.	FURNACE
FUT.	FUTURE
FAI	FRESH AIR INTAKE
G.R.	GUARD RAIL
GA.	GAUGE
GALV.	GALVANIZED
GL.	GLASS
GR.	GRILL
GRTG.	GRATING
GYP.	GYPSUM
GYP.BD.	GYPSUM BOARD
H.	HIGH
H.C.	HUNG CEILING
H.M.	HOLLOW METAL
H.P.	HIGH POINT
H.R.	HANDRAIL
H.S.	HIGH STRENGTH
H.V.A.C.	HEATING,VENTILATION & AIR CONDITIONING
HD.	HEAD
HDR.	HEADER
HEX.	HEXAGONAL
HGT.	HEIGHT
HORIZ.	HORIZONTAL
HR.	HOUR
HTR.	HEATER
I.D.	INSIDE DIAMETER
INCL.	INCLUDING
INFO.	INFORMATION
INSUL.	INSULATION
INT.	INTERIOR
JT.	JOINT
K.	KIPS
L.	ANGLE
L.L.	LIVE LOAD
L.P.	LOW POINT
L.W.	LIGHT WEIGHT
LAM.	LAMINATED
LAV.	LAVATORY
LG.	LONG
LT.	LIGHT
LTG.	LIGHTING
M.	MEN
M.D.	METAL DECK
M.H.	MANHOLE
M.O.	MASONRY OPENING
M.S.	MARBLE SADDLE
MAS.	MASONRY
MAT'L.	MATERIAL
MAX.	MAXIMUM
MECH.	MECHANICAL
MFG.	MANUFACTURER
MIN.	MINIMUM
MIRR.	MIRROR
MISC.	MISCELLANEOUS
MTL.	METAL
M.E.R.	MECHANICAL EQUIPMENT ROOM
MEBR.	MEMBRANE
N.	NORTH
N.F.	NEAR FACE
N.I.C.	NOT IN CONTRACT
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
NO., #	NUMBER
O.A.	OVER ALL
O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
O.H.	OVER HEAD
OPG./OPN'G.	OPENING
OPP.	OPPOSITE
P.E.	PASSENGER ELEVATOR
P.I.P.	POURED IN PLACE
P.S.F.	POUNDS PER SQUARE FOOT
P.S.I.	POUNDS PER SQUARE INCH
P.T.D.D.	PAPER TOWEL DISPENSER & DISPOSAL
PART.PTN	PARTITION
PENETR.	PENETRATION
PL.	PLATE
PLAS.	PLASTER
PLUMB.	PLUMBING
P.M.	PREMOLDED
PNL.	PANEL
POL.	POLISHED
PREFAB.	PREFABRICATED
PT.	PART
PTD.	PAINTED
PR.	PAIR
R.A.	RETURN AIR
PAV'T.	PAVEMENT
Q.T.	QUARRY TILE
R.	RISER
R.A.	RETURN AIR
R.D.	ROOF DRAIN
RAD.	RADIUS
REF.	REFERENCE
REFRIG.	REFRIGERATOR
REINF.	REINFORCED:ING:MENT
REQD.	REQUIRED
REVOL. DR.	REVOLVING DOORS
RM.	ROOM
R.O.	ROUGH OPENING
S.	SOUTH
S.C.	SELF CLOSING
S.F.	SQUARE FEET
S.P.	STARTING POINT
S.S.	SUBSTATION
SDL.	SADDLE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SLD'G.	SLIDING
SPEC.	SPECIFICATION
SQ.	SQUARE
ST.	STAINLESS
STIFF.	STIFFENER
STL.	STEEL
STOR.	STORAGE
STRUCT.	STRUCTURAL
SUSP.	SUSPENDED
SW.	SWITCH
SYS.	SYSTEM
S.A.	SUPPLY AIR
T.	TREAD
T.&B.	TOP AND BOTTOM
T.&G.	TONGUE AND GROOVE
T.&S.	TAPE AND SPACKLE
T.O.	TOP OF
T.O.MAS.	TOP OF MASONRY
T.O.SL.	TOP OF SLAB
T.O.S.	TOP OF STEEL
T.P.H.	TISSUE PAPER HOLDER
T.T.D.	TOILET TISSUE DISPENSER
TAN.	TANGENT
TEL.	TELEPHONE
TEMP.	TEMPORARY
TERM.	TERMINAL
THK.	THICK
THRU.	THROUGH
TRANSF.	TRANSFORMER
TYP.	TYPICAL
TEMP. GL.	TEMPERED GLASS
U.L.DES.	UNDERWRITERS LABORATORY DESIGN
U.N.	UNLESS NOTED
UNIF.	UNIFORM
UNFIN.	UNFINISHED
U.C.	UNDER CUT
U.S.	UNITED STATES
V.	VINYL
V.C.T.	VINYL COMPOSITE TILE
V.SHT.	VINYL SHEET
V.I.F.	VERIFY IN FIELD
VERT.	VERTICAL
VEST.	VESTIBULE
W.	WEST
W/O	WITHOUT
W/	WITH
W.C.	WATER CLOSET
W.P.	WORKING POINT
W.R.	WATER RESISTANT
W.W.F.	WELDED WIRE FABRIC
WD.	WOOD
W.F.	WATER FOUNTAIN
WPFG	WATERFROOFING
WTC	WORLD TRADE CENTER
WIND.	WINDOW
WFC	WORLD FINANCIAL CENTER

LEGEND

- FLOOR SLAB OPENING
- EXISTING COL. AND WALL
- COVER EXISTING FLOOR SLAB OPENING
- EXISTING CORE WALL
- CONC. SLAB EXTENSION
- EXIST. PARTITION TO REMAIN
- 2 HOURS FIRE RATED PARTITION PARTITION ON CONC. CURB
- 2 HOURS FIRE RATED PARTITION
- 2 HOURS FIRE RATED COREBOARD PARTITION
- UPGRADE EXIST. PARTITION
- EXIST. CONSTRUCTION TO BE REMOVED.
- EXIST. ALUMINUM PANEL
- INSUL. ALUMINUM PANEL
- EXIST. METAL LOUVER PARTITION TO REMAIN
- MET. WALL LOUVER
- ALUMINUM RAILING
- MATCH LINE
- ACOUSTIC CEILING TILES
- LIGHT FIXTURE SEE REFLECTED CLG. PLAN
- (E) EXIST. DOOR TO REMAIN
- (E_R) EXIST. DOOR-SWING REVERSED
- (R) EXIST. DOOR TO BE REMOVED AND SALVAGE
- (R_R) EXIST. DOOR TO BE REMOVED AND RELOCATE
- (0) H.M. SINGLE DOOR NO. OF DOOR
- (0) H.M. DOUBLE DOOR NO. OF DOOR

DRAWING CONVENTIONS

- PLAN INDICATOR: P | 0 / A-0 ← PLAN NO. ← DWG.NO.
- CONSTRUCTION INDICATOR: C | 0 / A-0 ← PLAN NO. ← DWG.NO.
- REMOVAL INDICATOR: R | 0 / A-0 ← PLAN NO. ← DWG.NO.
- DETAIL INDICATOR: D | 0 / A-0 ← DETAIL NO. ← DWG.NO.
- ELEVATION INDICATOR: E | 0 / A-0 ← ELEV. NO. ← DWG.NO.
- SECTION INDICATOR: S | 0 / A-0 ← SECT. NO. ← DWG.NO.
- DIRECTIONAL → ← ROUTING DIRECTION OF REMOVAL AND DELIVERY
- DIRECTION: N ← NORTH ARROW
- SPACE SYMBOL: 00 ← SPACE NO.
- ELEVATION SYMBOL ← FIN. FL. EL. 00
- COL. LINE BUBBLE: 0 ← COL. NO.

NOTES

1. ALL WOOD SHALL BE FIRE RETARDANT AS REQUIRED BY NYC BUILDING CODE.
2. PARTITION DIMENSIONS ARE TO CENTERLINE OF PARTITION UNLESS OTHERWISE NOTED.
3. CENTERLINES OF PARTITIONS ABUTTING WINDOW COLUMNS SHALL BE CENTERED ON THE COLUMNS, UNLESS OTHERWISE NOTED.
4. PARTITIONS NOT LOCATED BY A FIXED DIMENSION ON THE PLAN SHALL BE LOCATED AS SHOWN ON THE REFLECTED CEILING PLAN. PARTITIONS SHALL BE CENTERED ON THE TILE OR SPLINE AS SHOWN.
5. LOCATE ALL DOORS 6 IN. MINIMUM DISTANCE FROM ADJACENT INTERSECTING WALLS UNLESS OTHERWISE NOTED.
6. EXISTING FLOOR TILE SHALL BE CLEANED, WALL PARTITION AND FINISHES WHERE REQUIRED, SHALL BE RESTORED AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL BE REIMBURSED FOR SUCH RESTORATION ON A NET COST. SEE SECTION OF DIVISION #1 "NET COST WORK".
7. RUBBER BASE SHALL BE INSTALLED ON ALL PARTITIONS, BOTH SIDES UNLESS OTHERWISE NOTED.
8. THE CONTRACTOR SHALL PAINT ALL WALL SURFACES UNLESS OTHERWISE NOTED IN FINISH SCHEDULE.
9. THE CONTRACTOR SHALL PAINT EXISTING WALLS THAT ARE CUT AND/OR PATCHED. THE ENTIRE WALL SHALL BE PAINTED UP TO THE NEAREST EXTERNAL OR INTERNAL CORNER OR DOOR FRAME. COLOR SHALL MATCH EXISTING, UNLESS OTHERWISE NOTED IN FINISH SCHEDULE.
10. THE CONTRACTOR SHALL MODIFY EXISTING ACOUSTIC CEILING TILES AS REQUIRED TO ACCOMMODATE LAYOUT AS SHOWN ON REFLECTED CEILING PLAN P-1 DWG. A-29 AND SHALL REMOVE AND REPLACE EXISTING TILES AS REQUIRED FOR MECHANICAL, PLUMBING, ETC., INSTALLATIONS. AS DIRECTED BY THE ENGINEER.
11. CONTRACTOR SHALL SUBMIT COLOR PAINT SAMPLES FOR APPROVAL BY ENGINEER.

Sheet 6 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
ABBREVIATIONS,
LEGEND, DRAWING
CONVENTIONS AND NOTES

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	Task Leader
G.FARLEY	G.FARLEY	D.GALANG

Principal Architect

Date 5/1/95 Scale AS SHOWN

Contract Number WTC-802.071 Drawing Number A-1

ARCHITECTURAL STAGING NOTES

A. THE MEMBRANE WATERPROOFING SHALL LAY FLAT ON TOP OF THE CONCRETE SLAB BEFORE CEMENT FINISH COATING IS APPLIED IN PLACE, AFTER THE SLAB EXTENSIONS ARE CONSTRUCTED AND ALIGNED WITH THE ADJACENT FLOOR SLAB AFTER THE REQUIRED STRUCTURAL SUPPORTS HAVE BEEN INSTALLED.

STAGE I

1. THE CORRIDOR CONCRETE SLAB SHALL BE CONSTRUCTED, EXTENDED TO THE END OF THE CORE WALL AT SS 76 N TOWER ONE AND SS 76 W TOWER TWO TO MATCH THE ADJACENT EXISTING SLAB.

2. PORTION OF EXISTING CONCRETE CURB AND CONCRETE PAD SHALL BE REMOVED AFTER THE REMOVAL OF THE MECHANICAL H.V.A.C. UNIT DURING THE CONSTRUCTION OF THE ELECTRICAL SUBSTATION AS SHOWN ON CONSTRUCTION STAGING PLAN.

3. PATCH-UP DAMAGED CONCRETE SLAB AND EXISTING FLOOR SLAB OPENING TO MATCH EXISTING CONDITION AFTER THE REMOVAL OF EXISTING AIR PLENUM.

4. EXISTING CONCRETE CURB, METAL LADDER AND METAL RAILING SHALL BE REMOVED, PATCH-UP THE EXISTING OPENING THAT WAS DAMAGED DURING THE REMOVALS PHASE OF CONSTRUCTION.

5. PORTION OF EXISTING PARTITION AND SOME DOORS SHALL BE REMOVED AFTER THE REMOVAL OF EXISTING ELECTRICAL CONDUITS AND SWITCHGEAR.

6. EXISTING 3 1/2" DIAMETER LALLY COLUMNS, EXCEPT THOSE BEING REPLACED BY BEAM "X", SHALL BE REMOVED AFTER THE STRUCTURAL SUPPORTS ARE INSTALLED IN PLACE.

7. ALL OF THE PARTITION ENCLOSURES SHALL BE CONSTRUCTED IN PLACE AFTER THE REMOVAL OF EXISTING MECHANICAL EQUIPMENT AND PARTITION.

8. SLAB EXTENSION NO. 1 SHALL BE CONSTRUCTED TO MATCH EXISTING FLOOR SLAB BEFORE THE INSTALLATION OF THE MECHANICAL H.V.A.C. UNIT A.C.S. - 75N.

9. AT PORTION OF SLAB OPENING PROVIDE TEMPORARY SAFETY SCAFFOLDING AND PLATFORM FOR THE REMOVALS, DELIVERY AND INSTALLATION OF MECHANICAL H.V.A.C. UNIT ACS-75-1 AND ACCESS TO ELECTRICAL CONDUIT.

10. SLAB EXTENSION NO. 2 SHALL BE CONSTRUCTED TO MATCH THE CONSTRUCTION OF EXTENSION NO. 1 TO BE IN PLACE BEFORE THE INSTALLATION OF THE MECHANICAL H.V.A.C. UNIT A.C.S. - 75N.

11. FIRST PORTION OF EPOXY COATING CEMENT SHALL BE APPLIED ON THE TOP OF EXISTING FLOOR AFTER THE REMOVAL OF MECHANICAL EQUIPMENT AND BEFORE THE DELIVERY AND INSTALLATION OF ELECTRICAL SWITCHGEAR UNIT IN PLACE PRIOR TO THE MECHANICAL H.V.A.C. UNIT.

12. PORTION OF EXISTING PARTITION CEILING AND FLOOR SHALL BE REMOVED BEFORE THE REMOVAL OF THE MECHANICAL AIR PLENUM.

13. CUT EXISTING PARTITIONS AND PROVIDE OPENINGS FOR ELECTRICAL CONDUIT AND MECHANICAL DUCT PENETRATION.

STAGE II

1. FLOOR SLAB SHALL BE CLEANED, PATCH-UP ALL CRACKED AND DAMAGED AREAS AFTER THE REMOVAL OF EXISTING ELECTRICAL SWITCHGEAR. TO MATCH EXISTING CONCRETE SLAB.

2. SECOND PORTION OF EPOXY CEMENT COATING SHALL BE APPLIED ON TOP OF EXISTING FLOOR BEFORE THE DELIVERY AND INSTALLATION OF ELECTRICAL TRANSFORMER UNIT IN PLACE PRIOR TO MECHANICAL H.V.A.C. UNIT.

3. REMOVE AND REPLACE EXISTING METAL PARTITIONS AND PROVIDE METAL LOUVER TO SUIT MECHANICAL DUCT OPENING BEFORE H.V.A.C. UNIT IS SET IN PLACE.

4. GALVANIZED STEEL RAILING SHALL BE INSTALLED IN PLACE AFTER MECHANICAL H.V.A.C. UNIT IS DELIVERED AND SET IN PLACE.

5. GALVANIZED STEEL LADDER AND GALVANIZED STEEL RAILING SHALL BE INSTALLED AT 76TH FLOOR SOUTH SIDE ONLY AFTER MECHANICAL H.V.A.C. UNIT IS IN PLACE.

6. ALL THE REQUIRED UPGRADED PARTITIONS AND DOORS SHALL BE INSTALLED IN PLACE AFTER THE COMPLETION OF THE SLAB EXTENSION ABOVE FLOOR.

STAGE III

1. FLOOR SLAB SHALL BE CLEANED, PATCH-UP ALL CRACKED AND DAMAGED AREAS FROM THE REMOVAL OF EXISTING ELECTRICAL SWITCHGEAR AND AIR DUCT TO MATCH EXISTING.

2. LAST PORTION OF EPOXY CEMENT COATING SHALL BE APPLIED ON TOP OF EXISTING FLOOR BEFORE THE DELIVERY AND INSTALLATION OF ELECTRICAL SWITCHGEAR UNIT IN PLACE PRIOR TO MECHANICAL H.V.A.C. UNIT.

3. SLAB EXTENSION NO. 3 SHALL BE CONSTRUCTED TO MATCH THE ADJACENT SLAB EXTENSION NO. 1 AND NO. 2 AFTER THE REMOVAL OF TEMPORARY SCAFFOLDING AND PLATFORM.

4. ALL SIX SUBSTATIONS AND MECHANICAL ROOMS SHALL BE PAINTED AFTER THE INSTALLATION OF ALL ELECTRICAL SWITCHGEAR, TRANSFORMER, MECHANICAL H.V.A.C. UNIT AND OTHER EQUIPMENT IS SET IN PLACE.

5. THE CEILING SHALL BE INSTALLED AND SET IN PLACE AFTER ALL THE CONSTRUCTION AND THE MECHANICAL AND ELECTRICAL EQUIPMENT IS COMPLETED, SET IN PLACE AT 76TH FLOOR OF TOWERS ONE AND TWO.

6. ALL THE DOOR LOCKS, ELECTRICAL SYSTEMS AND MECHANICAL H.V.A.C. UNITS SHALL BE TESTED BEFORE TURNING THE KEY OVER TO THE ENGINEER.

FIREPROOFING REQUIREMENTS

ALL STRUCTURAL STEEL SHALL BE SPRAYED-ON FIREPROOFED WITH MEDIUM DENSITY CEMENTITIOUS FIREPROOFING AS PER THE FOLLOWING SCHEDULE:

COLUMNS	:	2 HOURS
BEAMS	:	2 HOURS
GIRDERS	:	2 HOURS
SLAB	:	2 HOURS

CONTRTOLLED INSPECTIONS

THE FOLLOWING ITEMS ARE SUBJECT TO CONTROLLED INSPECTIONS IN ACCORDANCE WITH ARTICLE 27-132 OF NYC BLDG. CODE:

1. FIRESTOPPING WITHIN BUILDINGS
2. FIREPROOFING OF STRUCTURAL STEEL
3. FIRE STANDPIPE SYSTEMS
4. SPRINKLER SYSTEMS
5. HVAC SYSTEMS
6. SUSPENDED CEILING SYSTEMS

Sheet 7 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweany
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
CONSTRUCTION STAGING NOTES, FIREPROOFING AND CONTROLLED INSPECTIONS

CONFORMED
7/17/95

No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

G.FARLEY	G.FARLEY	D.GALANG
Designed by	Drawn by	Task Leader

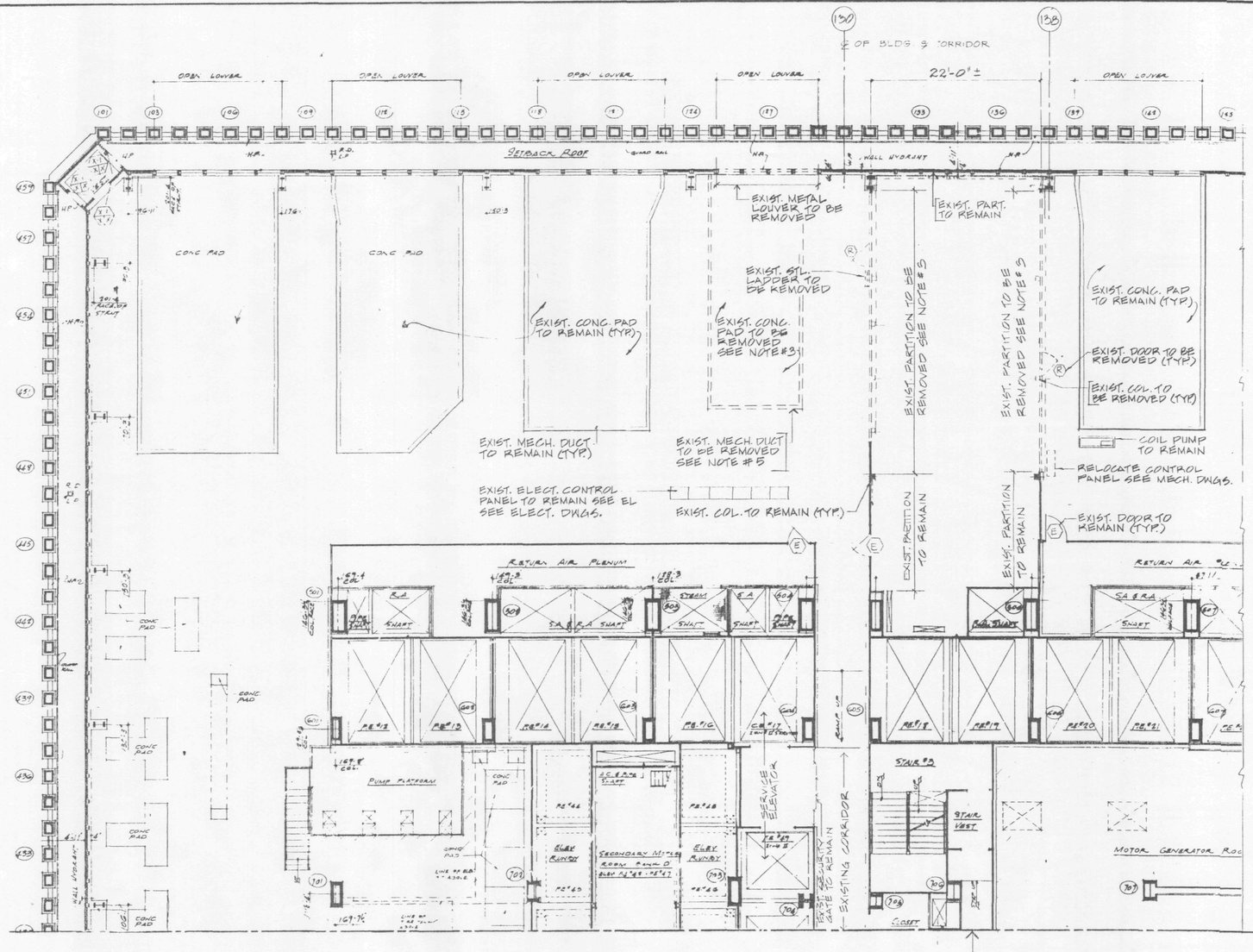
Principal Architect

Date 5/1/95 Scale AS SHOWN

Contract Number Drawing Number

WTC-802.071 A-2

T:\... 80304413.DWG ...

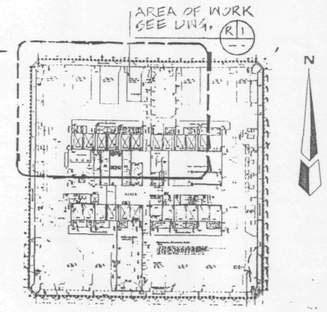


R 1 REMOVAL PLAN

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES, SEE DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DWG. A-1
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXISTING CONCRETE CURB AND EXISTING CONCRETE PAD AS SHOWN ON PLAN.
4. FOR ELECTRICAL LIGHTS AND GENERATOR REMOVAL, SEE ELECTRICAL DWG. E-8
5. FOR AIR DUCT REMOVAL, SEE MECHANICAL DWG. M-15



KEY PLAN

Sheet 8 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

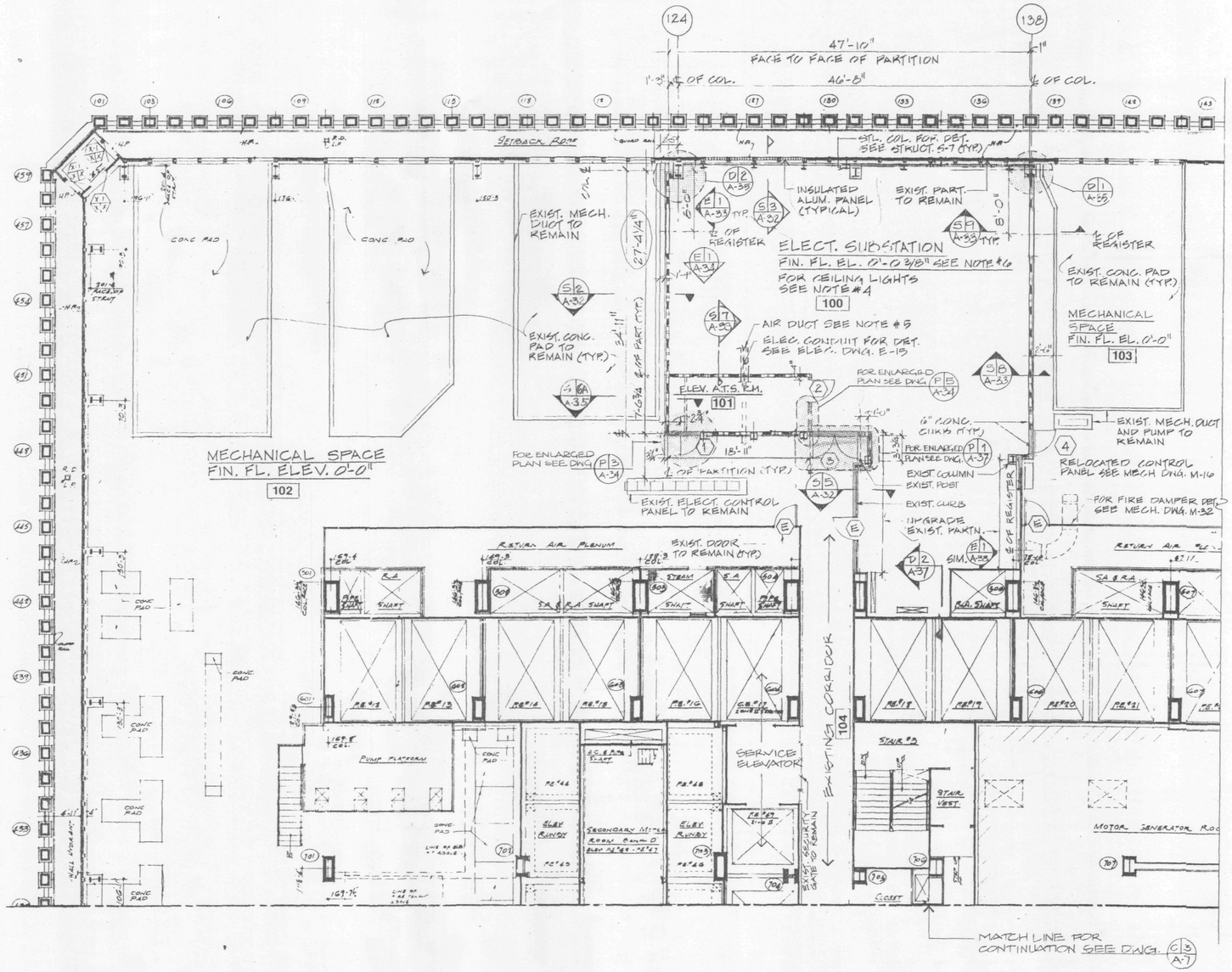
ARCHITECTURAL
SUBSTATION - SS 41 N
TOWER ONE
41st FLOOR
REMOVAL PLAN

CONFORMED
7/17/95
No. Date Revision Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

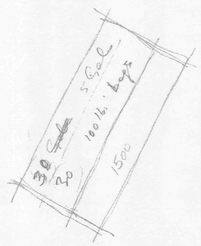
L.V.G. Designed by
R.J. Drawn by
L.V.G. TASK LEADER
PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

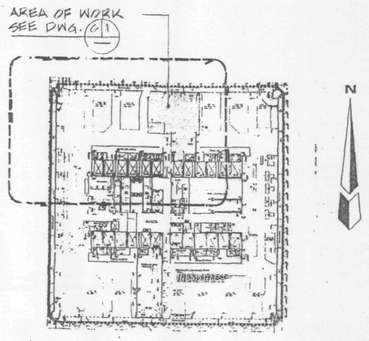
Contract Number NTC-902.071
Drawing Number A-3



C/1 CONSTRUCTION PLAN

SCALE IN FEET 0 8 16





KEY PLAN

NOTES:

1. FOR GENERAL NOTES SEE NOTE NO. 2, 5 AND 6 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DWG. A-1.
3. FOR PAINTING, SEE FINISH SCHEDULE.
4. FOR SUBSTATION CEILING LIGHTS LOCATION AND DETAILS SEE ELECTRICAL DWG. E-20.
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL SEE MECHANICAL DWG. M-16
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'-0 3/8") WITH RESPECT TO ELEVATION 0'-0". DATUM (0'-0") IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.

Sheet 9 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41N
TOWER ONE
41st FLOOR
CONSTRUCTION PLAN

CONFORMED
7/17/95

No.	Date	Revision	Approved

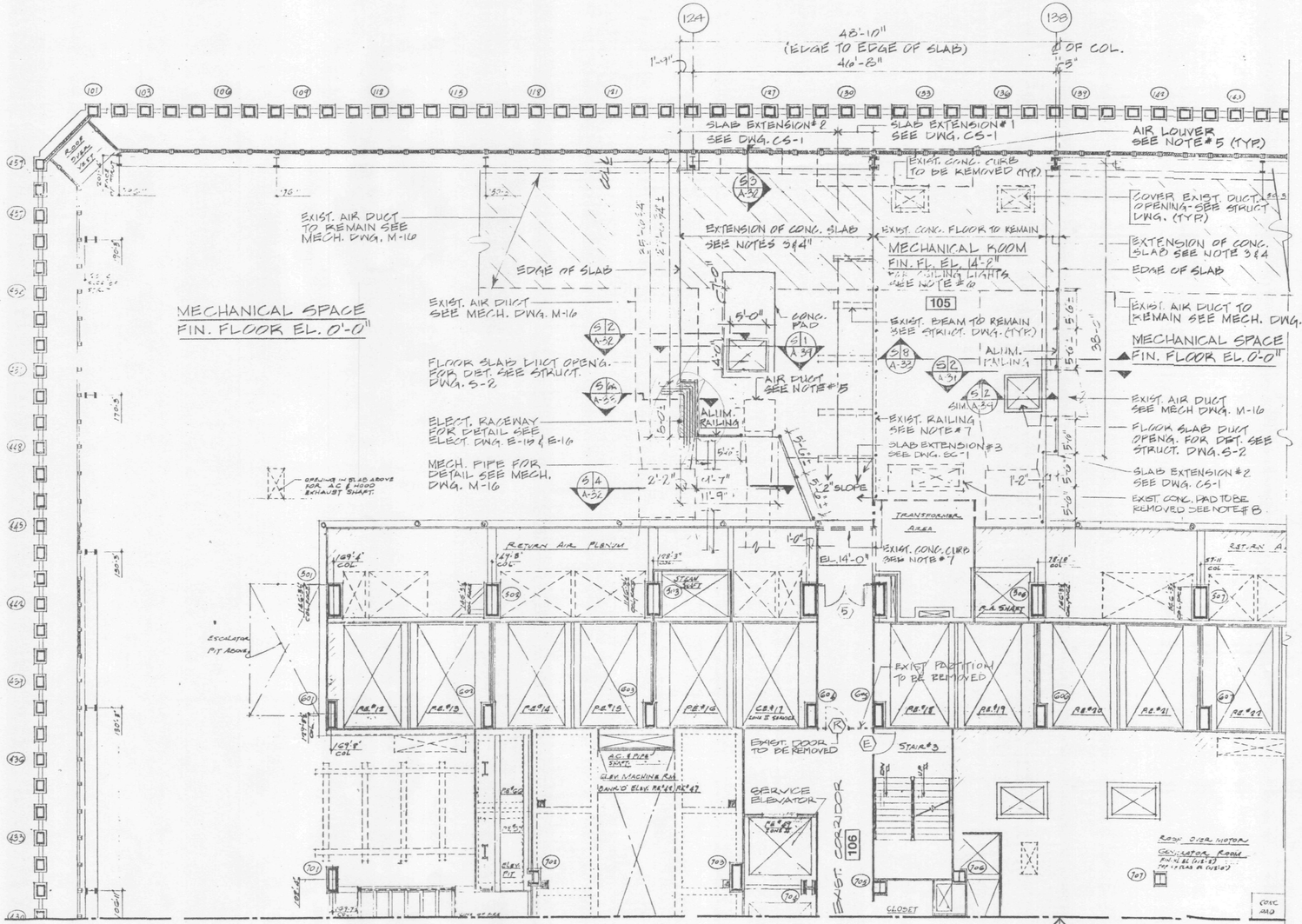
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	TASK LEADER

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-4

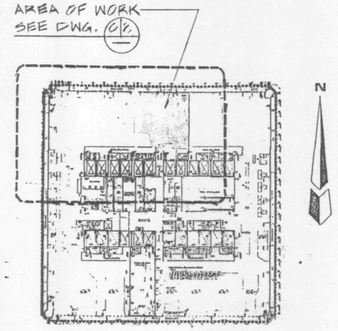


C/2 — CONSTRUCTION PLAN

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES SEE NOTE NO. 2, 3, 6 AND 7 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DWG. A-1
3. CONTRACTOR SHALL ALIGN EXTENSION OF CONCRETE SLAB ELEVATION WITH THE ADJACENT EXISTING CONCRETE FLOOR EVEVATION.
4. FOR CONCRETE SLAB EXTENSION AND DETAIL SEE STRUCTURAL DWG. S-2
5. FOR AIR DUCT, LOUVER LOCATION AND DETAILS, SEE MECHANICAL DWG. M-8
6. FOR MECHANICAL ROOM CEILING LIGHTS LOCATION AND DETAILS SEE ELECTRICAL DWG. E-9.
7. THE CONTRACTOR SHALL REMOVE EXISTING CONCRETE CURB AND STEEL RAILING, PATCH UP ANY DAMAGED FINISH TO MATCH EXISTING ADJACENT FLOOR SLABS.
8. EXISTING CONCRETE PAD TO BE REMOVED AND EXISTING OPENING TO BE COVERED SEE STRUCTURAL DWG.



KEY PLAN

Sheet 10 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41 N
TOWER ONE
42nd FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED
7/17/95

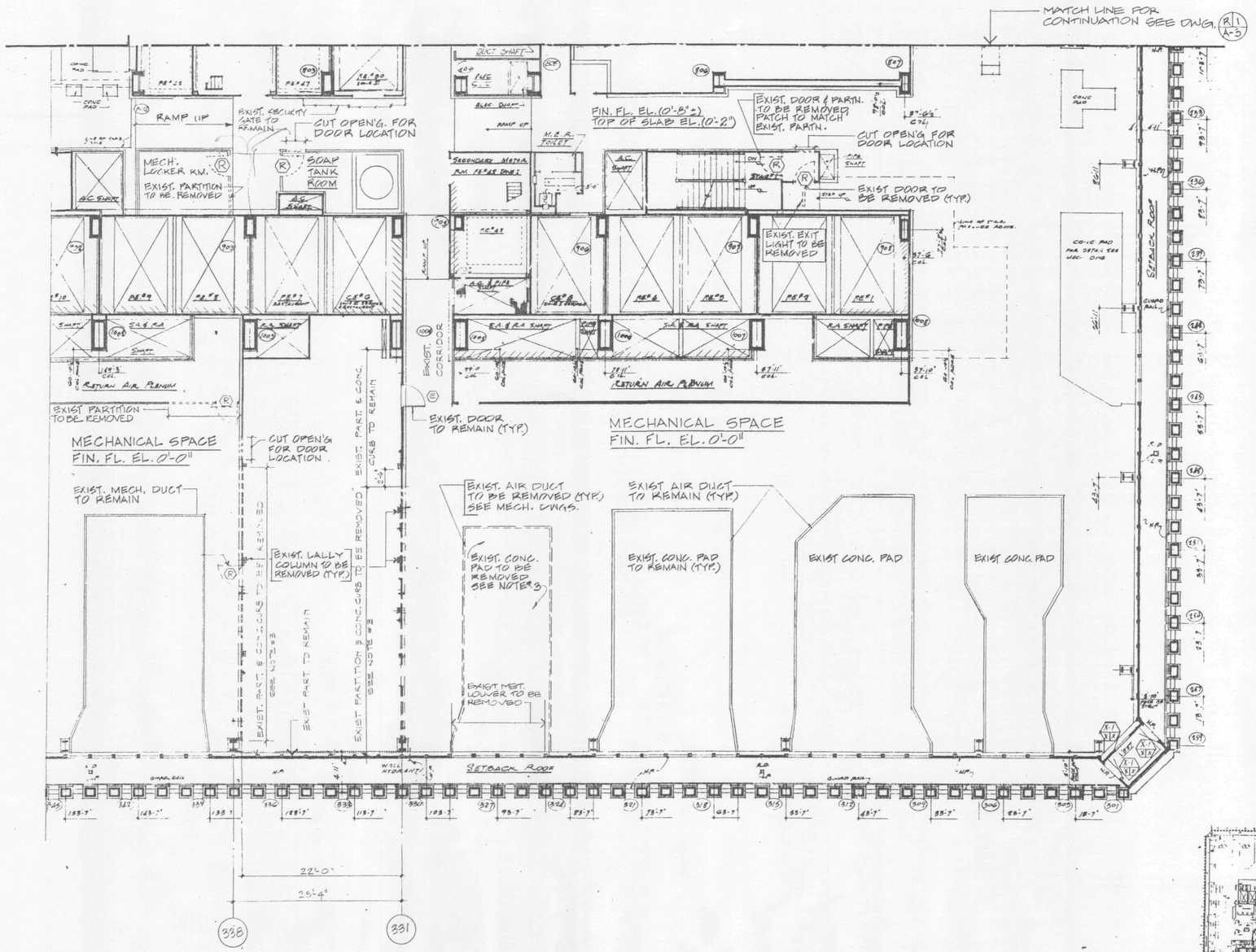
No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-5

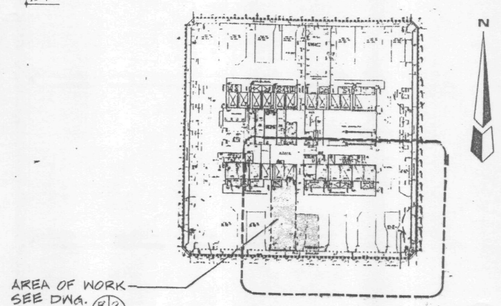


R 2 — REMOVAL PLAN

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES SEE NOTE No. 2, 3, 6 AND 7 ON DRAWING T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DWG. CONVENTIONS SEE DWG. A-1.
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXIST. CONC. CURB AND EXIST. CONC. PAD AS SHOWN ON PLAN.



KEY PLAN

Sheet 11 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41S
TOWER ONE
41st FLOOR
REMOVAL PLAN

CONFORMED

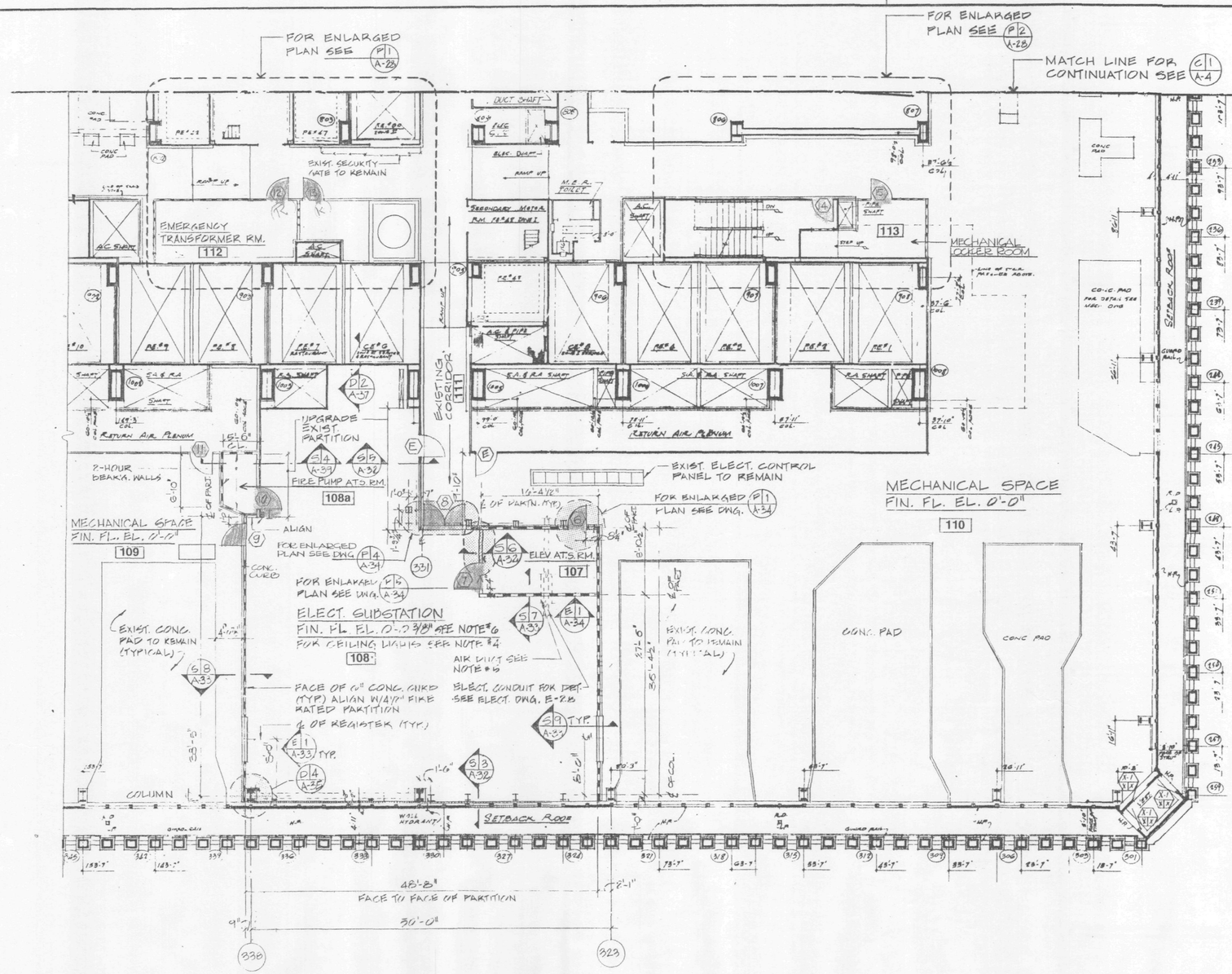
No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-6

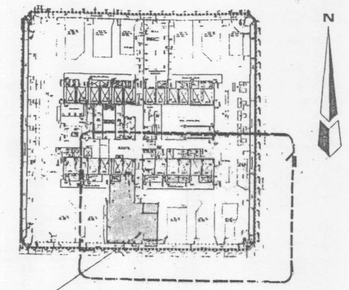


NOTES:

1. FOR GENERAL NOTES SEE NOTE No. 2, 3, AND 6 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS SEE DRAWING A-1.
3. FOR PAINTING SEE FINISH SCHEDULE
4. FOR ELECTRICAL SUBSTATION CEILING LIGHT LOCATION AND DETAIL, SEE ELECTRICAL DRAWING E-32.
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL SEE MECHANICAL DRAWING M-20.
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'-0 3/8") WITH RESPECT TO ELEVATION 0'-0", DATUM (100') IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.

C 3 — CONSTRUCTION PLAN

SCALE IN FEET 0 8 16



KEY PLAN

Sheet 12 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41S
TOWER ONE
41st FLOOR
CONSTRUCTION PLAN

CONFORMED

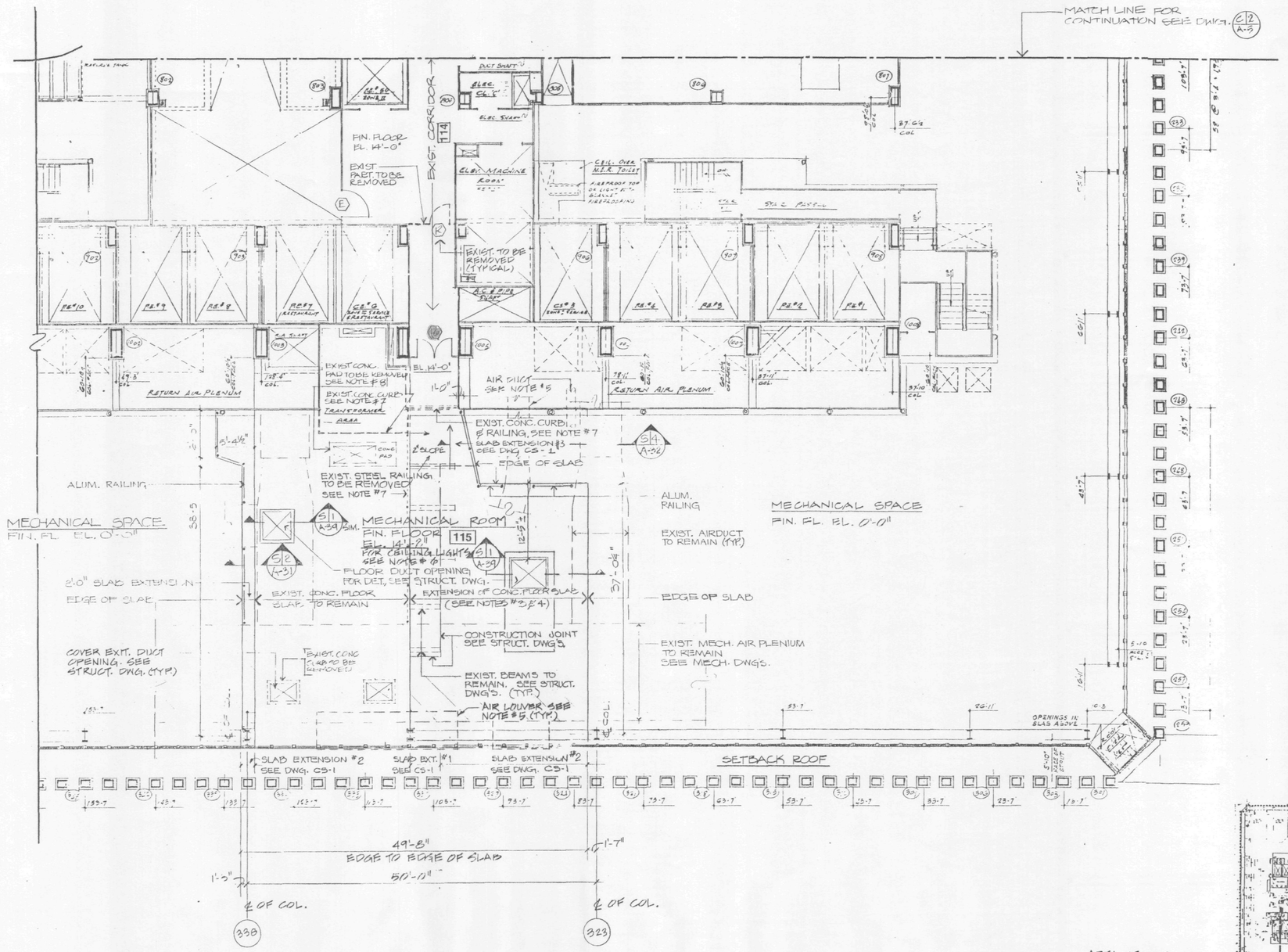
No.	Date	Revision	Approved
	7/17/96		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	TASK LEADER
L.V.G.	R.J.	L.V.G.

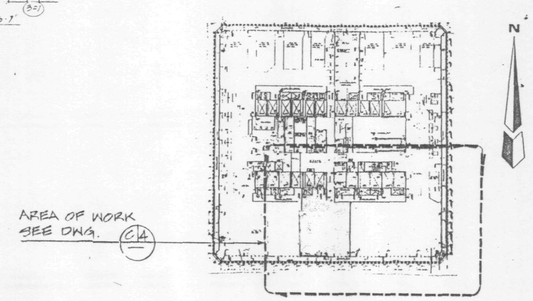
PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number: WTC-802.071
Drawing Number: A-7



C4 CONSTRUCTION PLAN

0 8 16
SCALE IN FEET



KEY PLAN

NOTES:

1. FOR GENERAL NOTES, SEE NOTE No. 2, 3, 6 AND 7 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DWG. A-1
3. CONTRACTOR SHALL ALIGN EXTENSION OF CONC. SLAB ELEVATION WITH THE ADJACENT EXISTING CONCRETE FLOOR ELEVATION.
4. FOR CONCRETE SLAB EXTENSION AND DETAIL, SEE STRUCTURAL DWG. S-2
5. FOR AIR DUCT, LOUVER LOCATION AND DETAILS SEE DWG. M-12
6. FOR MECHANICAL ROOM CEILING LIGHTS LOCATION AND DETAILS SEE ELECTRICAL DWG. E-22.
7. THE CONTRACTOR SHALL REMOVE CONCRETE CURB AND STEEL RAILING. PATCH UP ANY CRACKED DAMAGED FINISH TO MATCH EXISTING ADJACENT FLOOR SLAB.
8. EXISTING CONCRETE PAD TO BE REMOVED AND EXIST. OPENING TO BE COVERED SEE STRUCTURAL DWG.

Sheet 13 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41S
TOWER ONE
42nd FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED

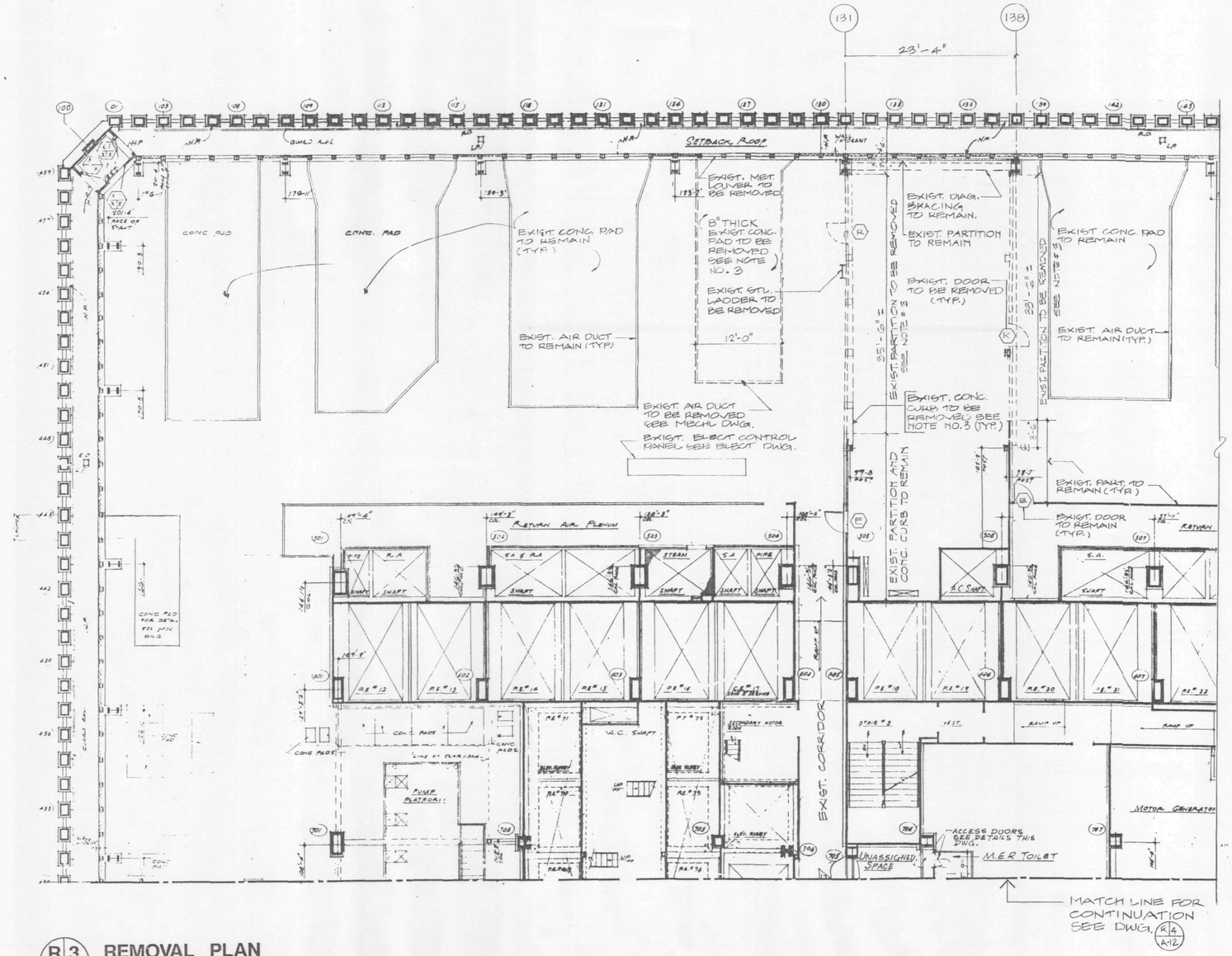
No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-8



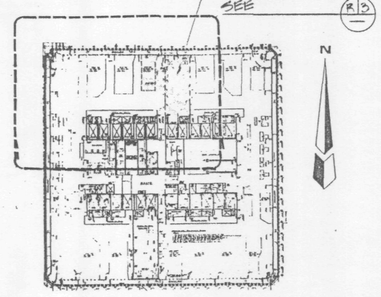
R 3 — REMOVAL PLAN

0 8 16

SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES SEE NOTES No. 2, 3, & 6 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND & DRAWING CONVENTIONS SEE DWG-A-1.
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXISTING CONCRETE CURB AND EXISTING CONCRETE PAD AS SHOWN ON PLAN.



KEY PLAN

Sheet 14 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER WORLD TRADE CENTER

for CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75N
TOWER ONE
75th FLOOR
REMOVAL PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

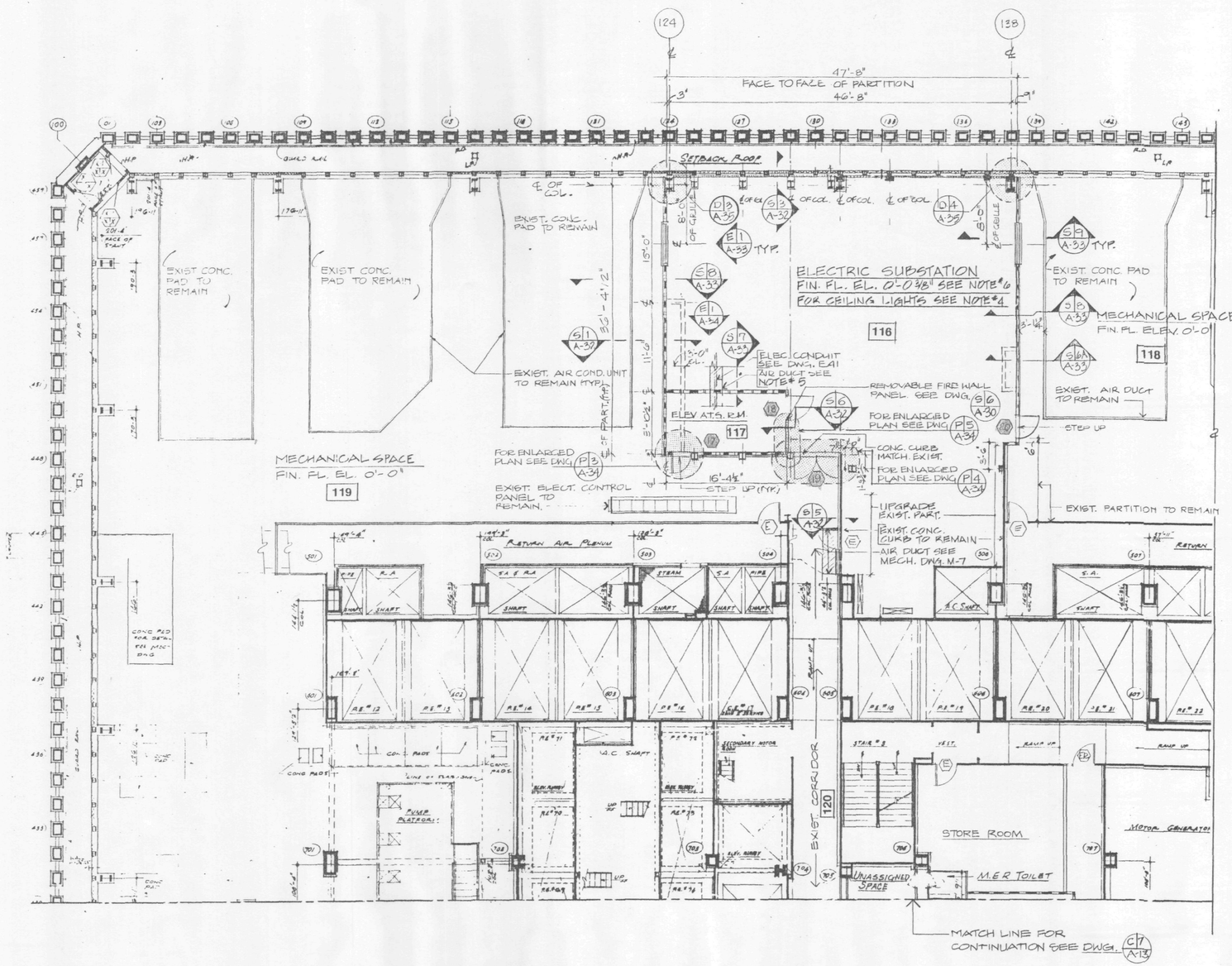
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-9

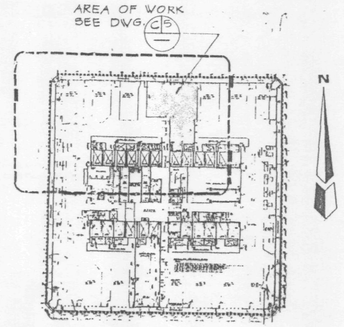


C 5 — CONSTRUCTION PLAN

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES, SEE NOTES NO. 2, 3 AND 6 ON DWG T-3
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DWG. CONVENTIONS, SEE DWG A-1
3. FOR PAINTING, SEE FINISH SCHEDULE
4. FOR SUBSTATION CEILING LIGHTS LOCATION, AND DETAILS, SEE ELECTRICAL DRAWING E-45.
5. FOR AIR DUCT, LOUVER LOCATION AND DETAILS, SEE MECHANICAL DWG. M-7
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'0 3/8") WITH RESPECT TO EL. 0'0". DATUM: (0'0") IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.



KEY PLAN

Sheet 15 of 224

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75N
TOWER ONE
75th FLOOR
CONSTRUCTION PLAN

CONFORMED
7/17/95

No. Date Revision Approved

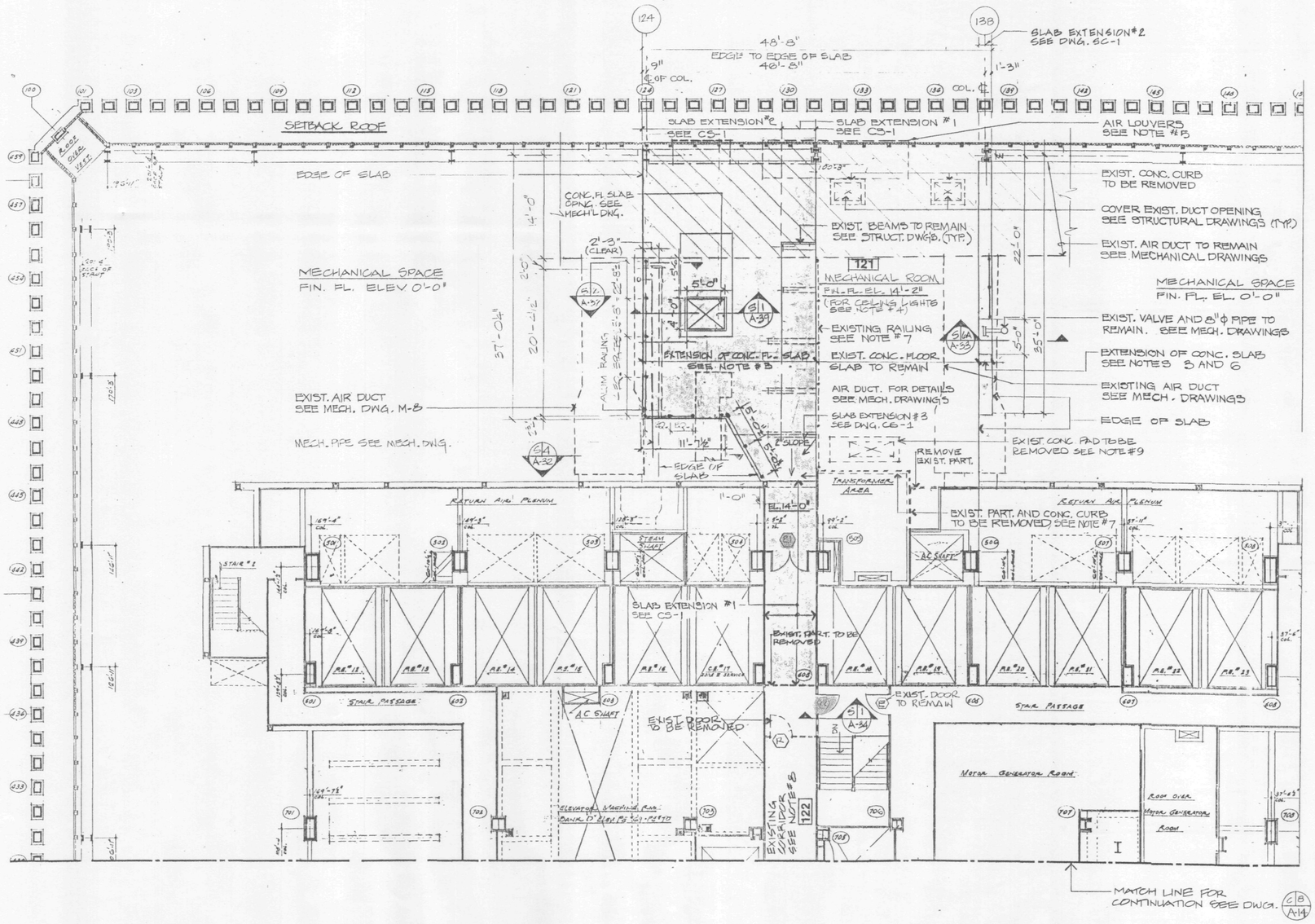
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-10

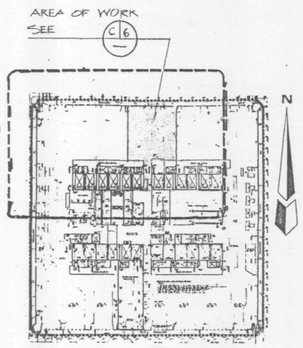


C 6 **CONSTRUCTION PLAN**

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES, SEE NOTE NO'S 2, 3 AND 6 ON DWG. T-3
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS. SEE DWG. A-1.
3. THE CONTRACTOR SHALL ALIGN EXTENSION OF CONC. SLAB ELEVATION WITH THE ADJACENT EXISTING CONCRETE FLOOR ELEVATION. FOR DETAIL SEE STRUCTURAL DWG. S-4.
4. FOR MECHANICAL ROOM CEILING LIGHTS, SEE ELECTRICAL DWG. E-35
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL, SEE MECHANICAL DWG. M-17
6. FOR CONCRETE SLAB EXTENSION AND DETAILS, SEE STRUCTURAL DWG. S-4
7. THE CONTRACTOR SHALL REMOVE EXISTING CONCRETE CURB AND STEEL RAILING. PATCH UP ANY CRACKED DAMAGED FINISH TO MATCH EXISTING ADJACENT FLOOR SLAB.
8. FOR EXISTING CORRIDOR CEILING PLAN SEE DWG. A-29
9. EXISTING CONCRETE PAD TO BE REMOVED AND EXISTING OPENING TO BE COVERED SEE STRUCTURAL DWG.



KEY PLAN

Sheet 16 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75N
TOWER ONE
76th FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED
7/17/95

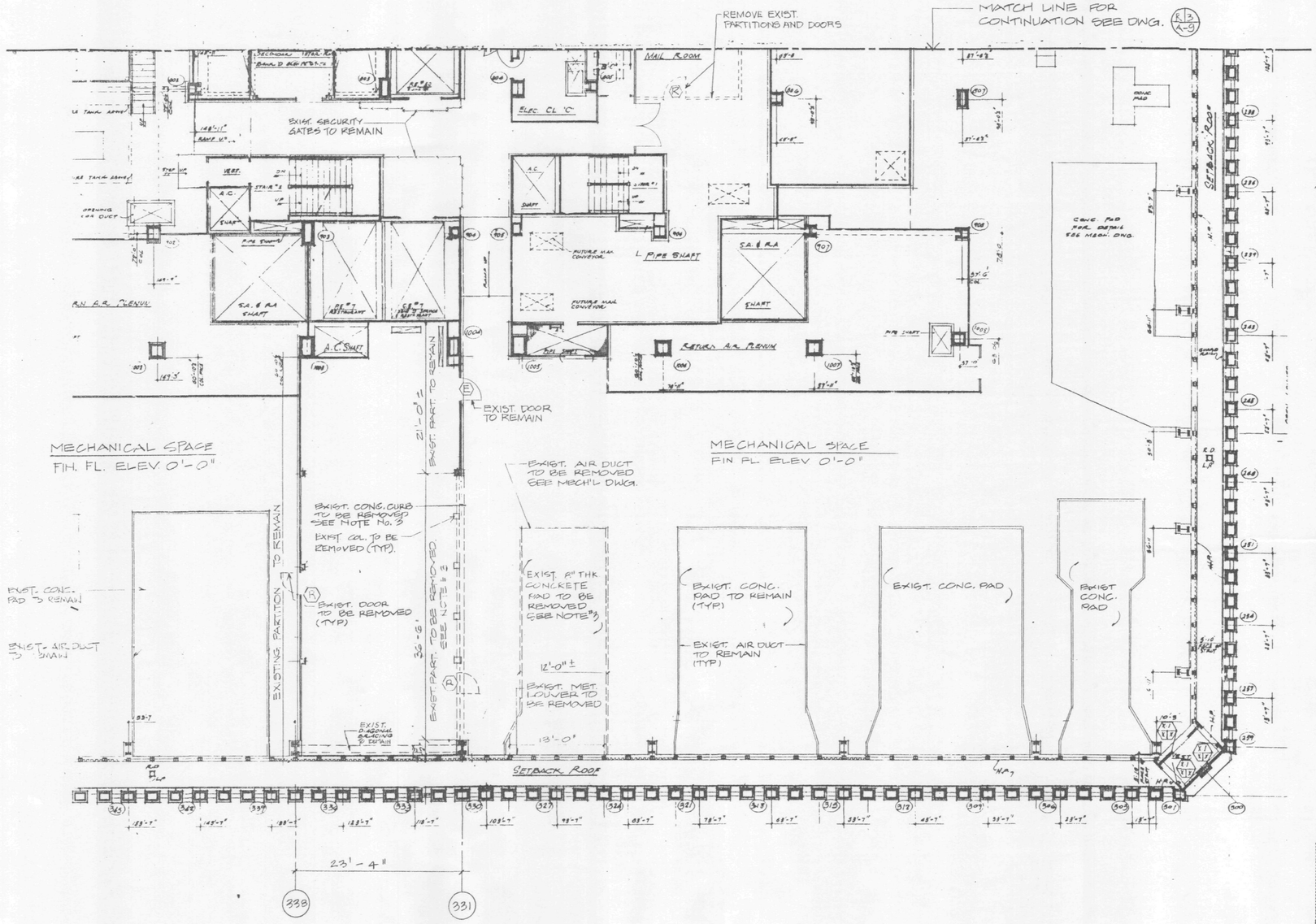
No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS SHOWN

Contract Number WTC-802.071 Drawing Number A-11

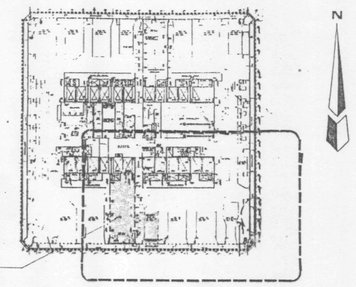


NOTES:

1. FOR GENERAL NOTES SEE NOTE NO. 2, 3 AND 6 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS SEE DRAWING A-1
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXISTING CONCRETE CURB AND EXISTING CONCRETE PAD AS SHOWN ON PLAN, PATCH FLOOR TO MATCH EXISTING.
4. FOR ELECTRICAL LIGHTS AND GENERATOR REMOVAL SEE ELECTRICAL DWG. E-47
5. FOR AIR DUCT REMOVAL SEE MECHANICAL DWG. M-11

R/4 **REMOVAL PLAN**

0 8 16
SCALE IN FEET



KEY PLAN

Sheet 17 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75S
TOWER ONE
75th FLOOR
REMOVAL PLAN

CONFORMED

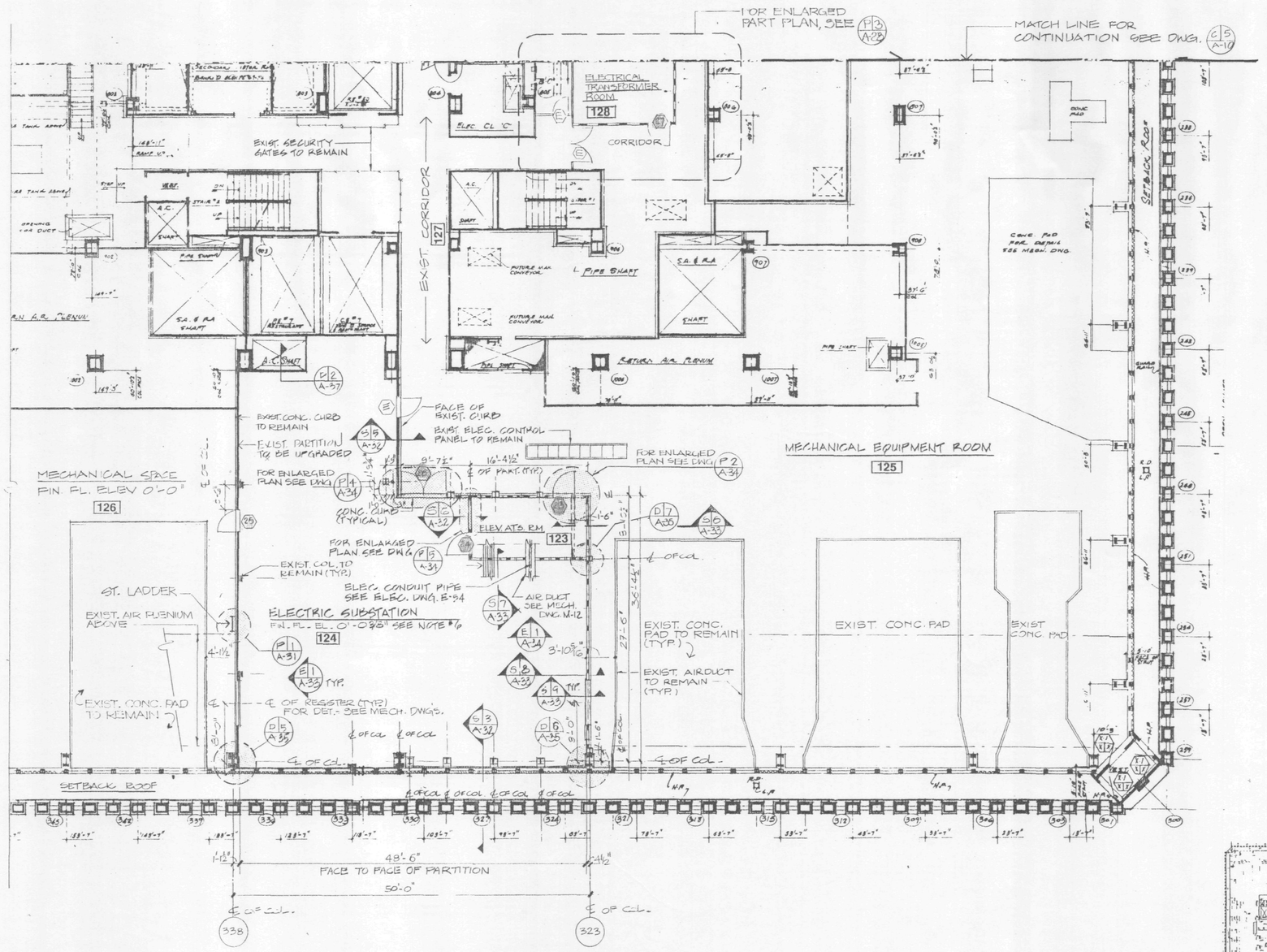
No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-12

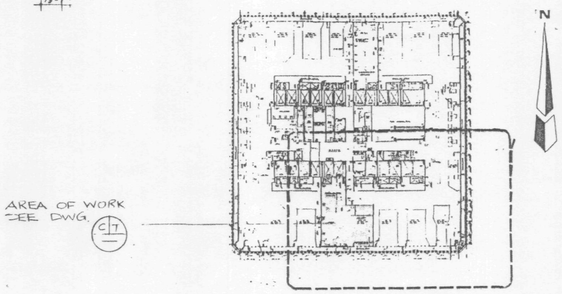


NOTES:

1. FOR GENERAL NOTES SEE NOTES NO. 2, 3 & 6 ON DWG. T3
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DWG. CONVENTIONS SEE DWG. A-1
3. FOR PAINTING, SEE FINISH SCHEDULE.
4. FOR SUBSTATION CEILING LIGHTS LOCATION AND DETAIL, SEE ELECTRICAL DWG. E-45
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL, SEE MECHANICAL DWG. M-12.
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'-0") WITH RESPECT TO ELEVATION 0'-0". DATUM: (0'-0") IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.

C 7 — CONSTRUCTION PLANT

SCALE IN FEET 0 5 10



KEY PLAN

Sheet 18 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75S
TOWER ONE
75th FLOOR
CONSTRUCTION PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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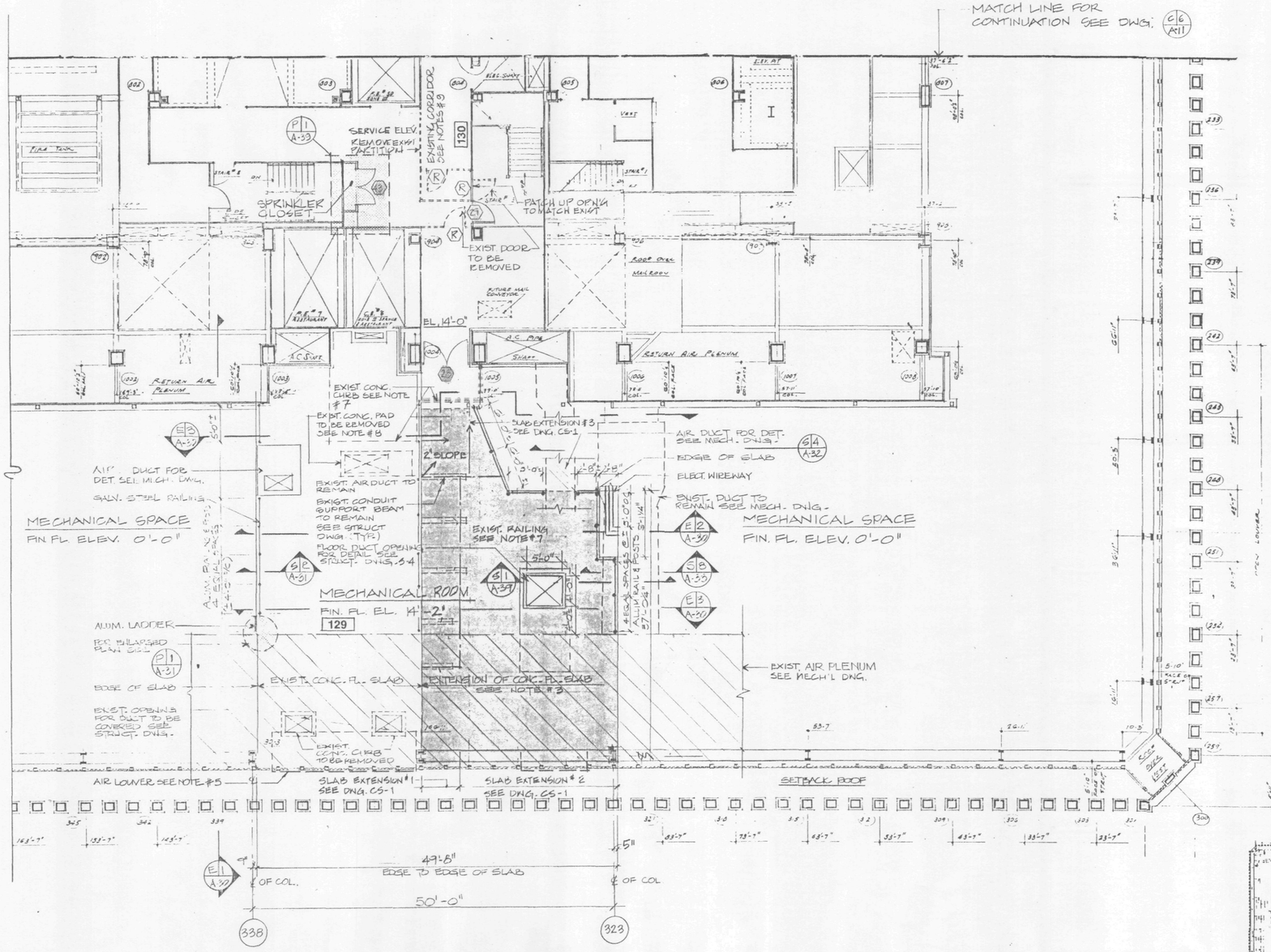
Designed by	Drawn by	Task Leader
L.V.G.	R.J.	L.V.G.

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-13



C/8 CONSTRUCTION PLAN

0 8 16
SCALE IN FEET

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THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75S
TOWER ONE
76th FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED
7/17/95

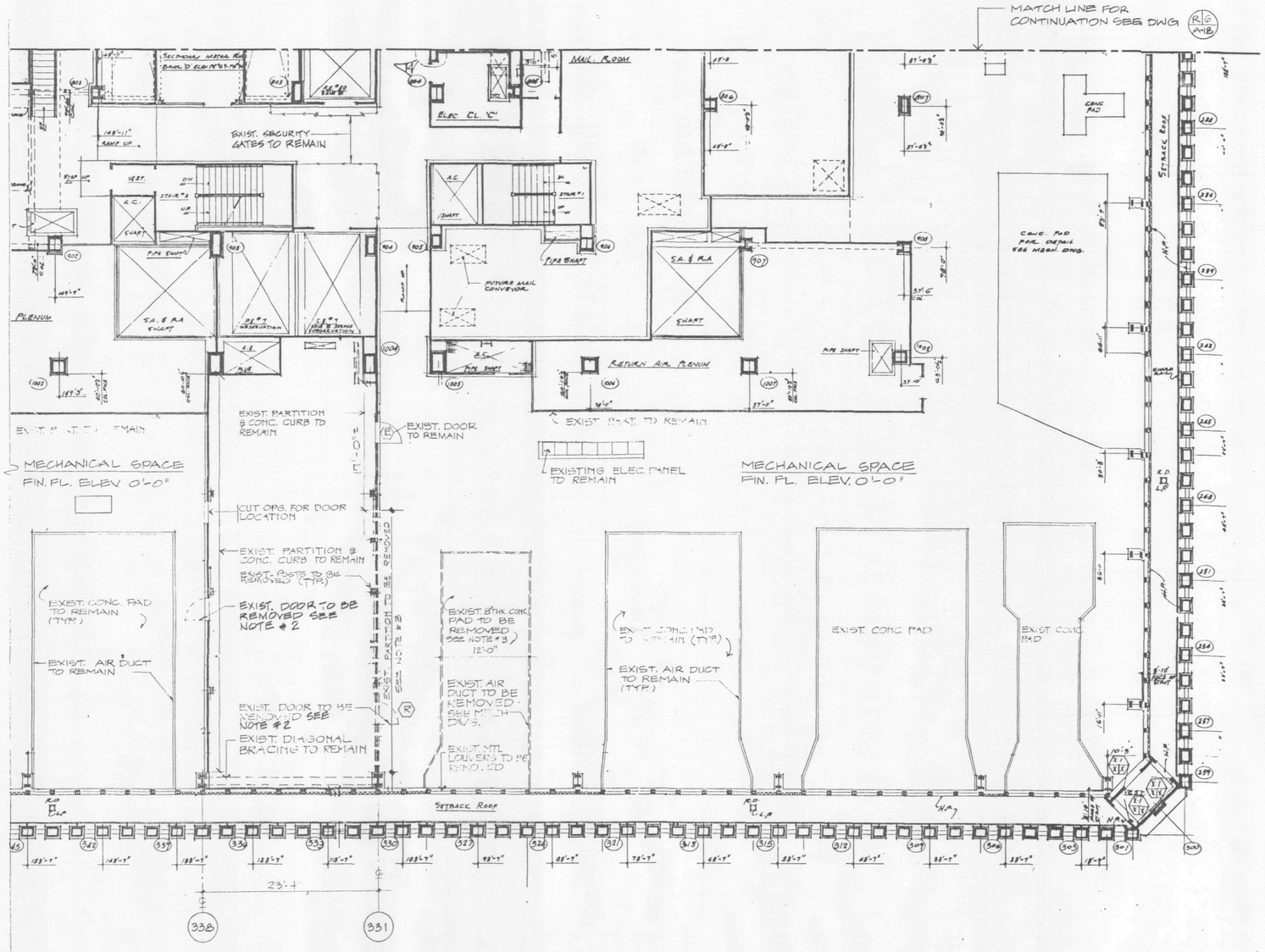
No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-14

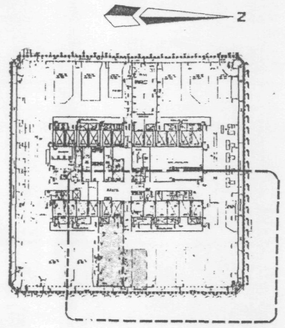


R5 **REMOVAL PLAN**

0 8 16
SCALE IN FEET

NOTES:

1. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND & DRAWING CONVENTIONS SEE DRAWING A-1.
2. PATCH-UP DOOR OPENING WITH PARTITION CONSTRUCTION TO MATCH ADJACENT PARTITION WITH 2 HOUR RATING.
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXISTING CONCRETE CURB AND EXISTING CONCRETE PAD AS SHOWN ON PLAN.
4. FOR ELECTRICAL CEILING LIGHTS AND GENERATOR REMOVAL SEE ELECTRICAL DWG. E-80.
5. FOR AIR DUCT REMOVAL SEE MECHANICAL DWG. M-28.



AREA OF WORK SEE R5

KEY PLAN

Sheet 20 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75E
TOWER TWO
75th FLOOR
REMOVAL PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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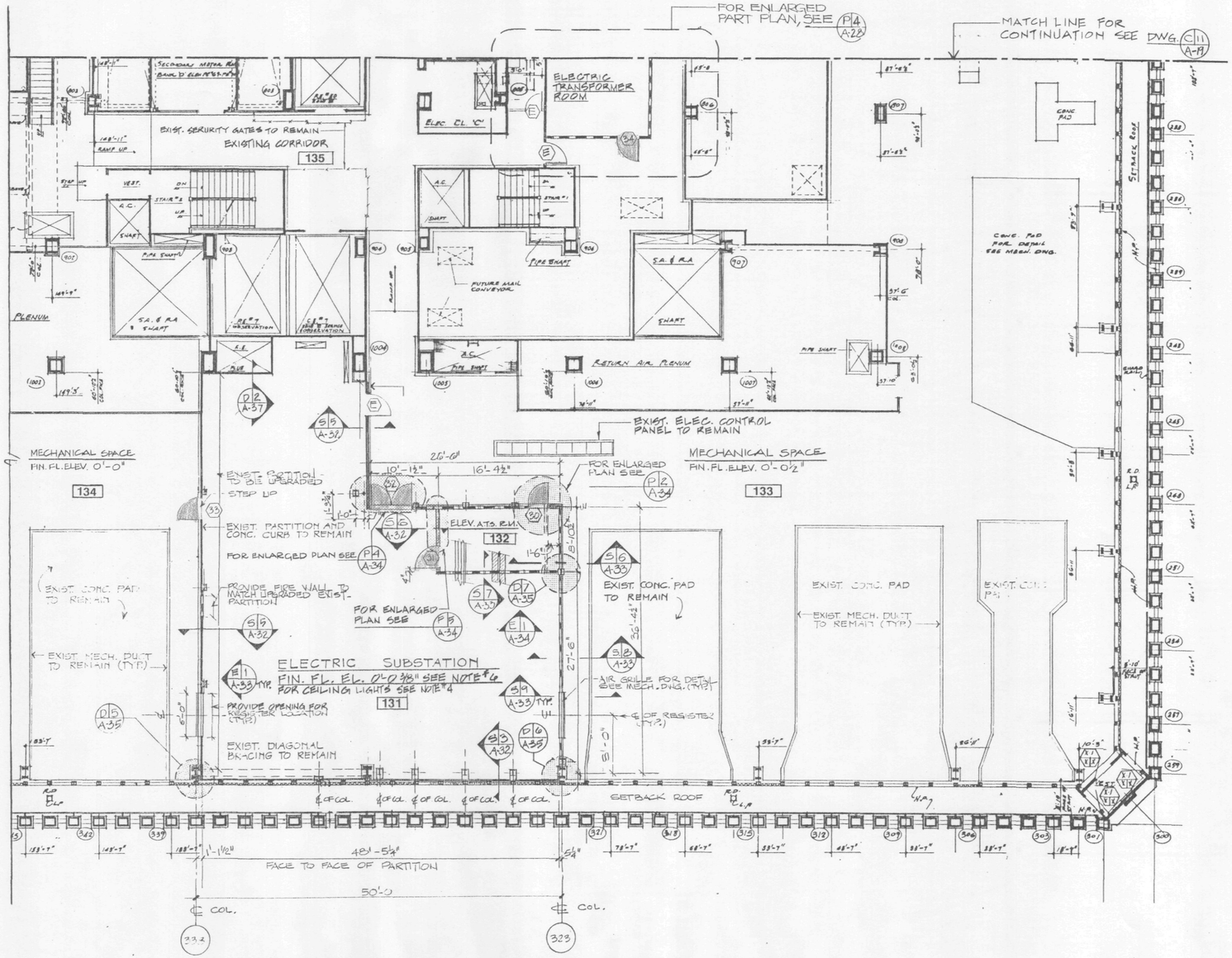
L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

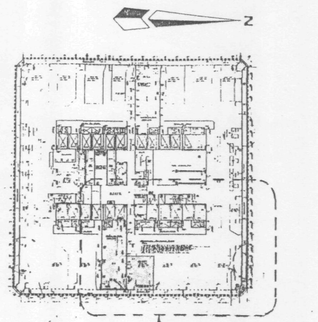
PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-15



C9 CONSTRUCTION PLAN

SCALE IN FEET 0 8 16



KEY PLAN

NOTES:

1. FOR GENERAL NOTES SEE NOTES NO. 2, 3 & 6 ON DRAWING T-4.
2. FOR ARCHITECTURAL NOTES ABBREVIATIONS, LEGEND & DRAWING CONVENTIONS SEE DRAWING A-1.
3. FOR PAINTING SEE FINISH SCHEDULE.
4. FOR SUBSTATION CEILING LIGHTS, LOCATION AND DETAILS, SEE ELECTRICAL DWG. E-92.
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL SEE MECHANICAL DWG. M-12.
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'-0") WITH RESPECT TO ELEVATION 0'-0" DATUM: (0'-0") IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.

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THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title

TOWER ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75E
TOWER TWO
75th FLOOR
CONSTRUCTION PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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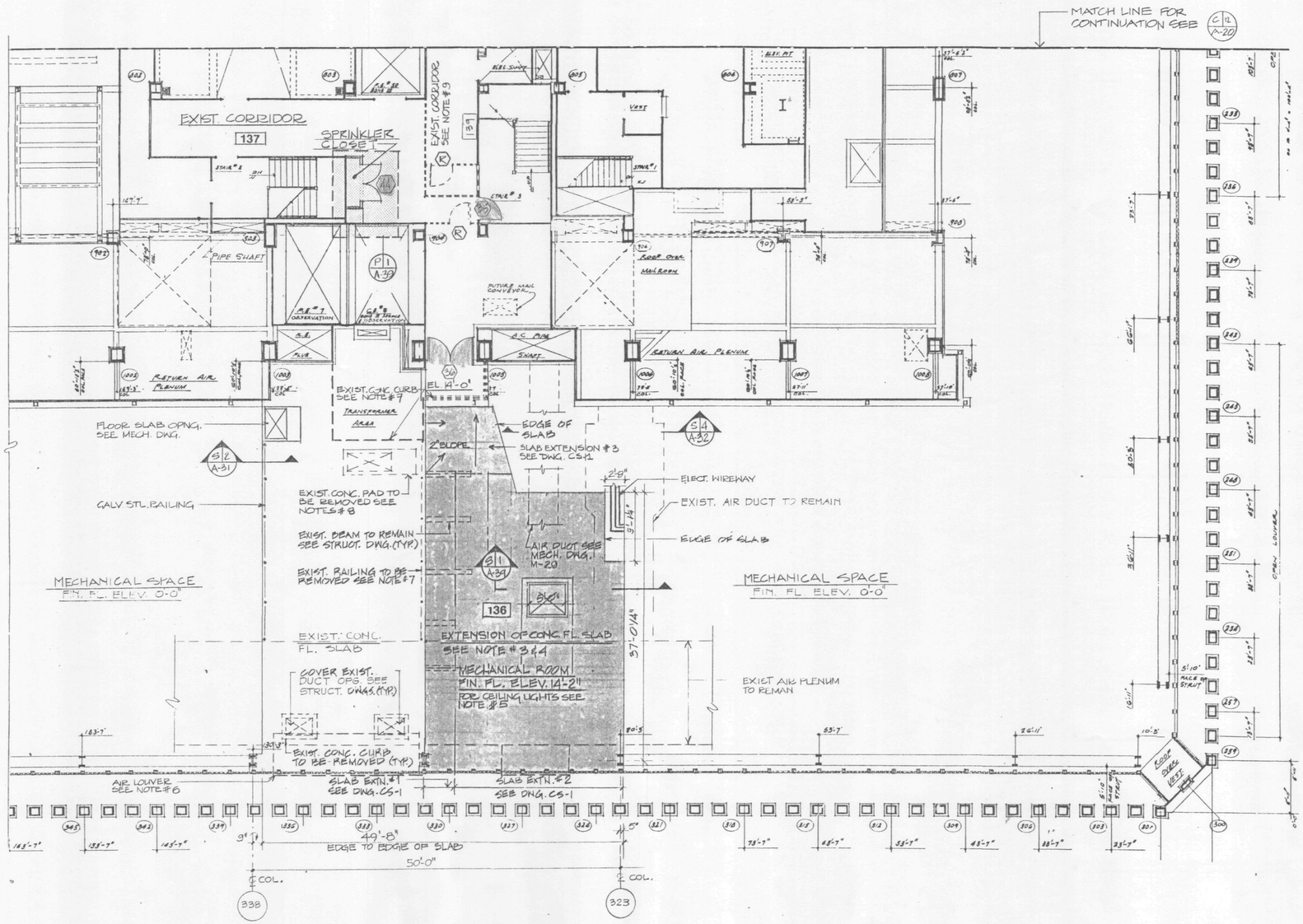
Designed by	Drawn by	Task Leader
L.V.G.	R.J.	L.V.G.

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number: WTC-802.071
Drawing Number: A-16



C 10 — CONSTRUCTION PLAN

SCALE IN FEET 0 8 16

NOTES:

1. FOR GENERAL NOTES SEE NOTES NO. 2, 3 & 6 ON DWG. T-4
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS LEGEND & DRAWING CONVENTIONS SEE DRAWING A-1
3. THE CONTRACTOR SHALL ALIGN EXTENSION OF CONCRETE SLAB ELEVATION WITH ADJACENT EXISTING CONCRETE FLOOR ELEVATION FOR DETAILS SEE STRUCTURAL DWGS.
4. FOR CONCRETE SLAB EXTENSION AND DETAILS SEE STRUCTURAL DWG. S-6.
5. FOR MECHANICAL ROOM CEILING LIGHTS LOCATION AND DETAILS, SEE ELECTRICAL DWG. E-32.
6. FOR AIR DUCT, LOUVER LOCATION AND DETAILS, SEE MECHANICAL DWG. M-29
7. THE CONTRACTOR SHALL REMOVE EXISTING CONCRETE CURB AND STEEL RAILING, PATCH UP ANY DAMAGED FINISH TO MATCH EXISTING ADJACENT FLOOR SLAB.
8. EXISTING CONCRETE PAD TO BE REMOVED AND EXISTING OPENING TO BE COVERED SEE STRUCTURAL DWG.
9. FOR EXISTING CORRIDOR CEILING PLAN SEE DWG. A-29

Sheet 22 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75E
TOWER TWO
76th FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED
7/17/95

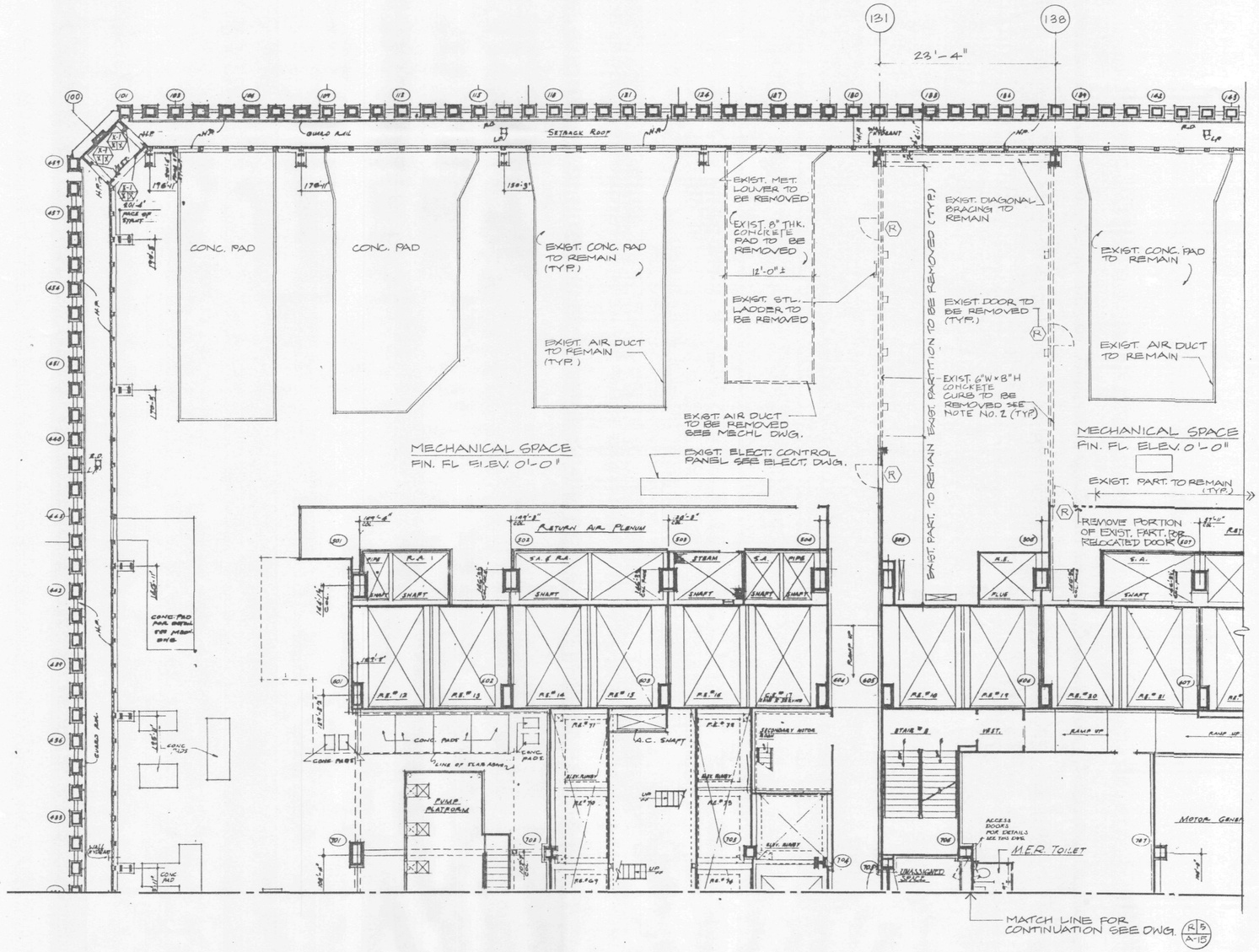
No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	Task Leader
L.V.G.	R.J.	L.V.G.

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-17



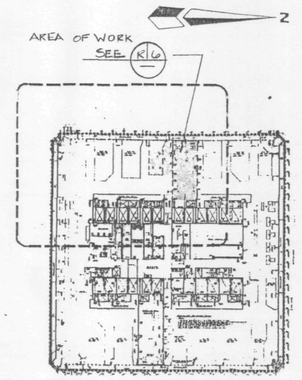
R6 — REMOVAL PLAN

0 8 16

SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES, SEE DWG. T-4
2. FOR ARCHITECTURAL NOTE, ABBEVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DWG. A-1.
3. THE CONTRACTOR SHALL REMOVE PORTION OF EXISTING CONCRETE CURB AND EXISTING CONCRETE PAD AS SHOWN ON PLAN.
4. FOR ELECTRICAL LIGHTS AND GENERATOR REMOVAL, SEE ELECTRICAL DWG. E-
5. FOR AIR DUCT REMOVAL, SEE MECHANICAL DWG. M-24



KEY PLAN

Sheet 23 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL

SUBSTATION - SS 75W
TOWER TWO
75th FLOOR
REMOVAL PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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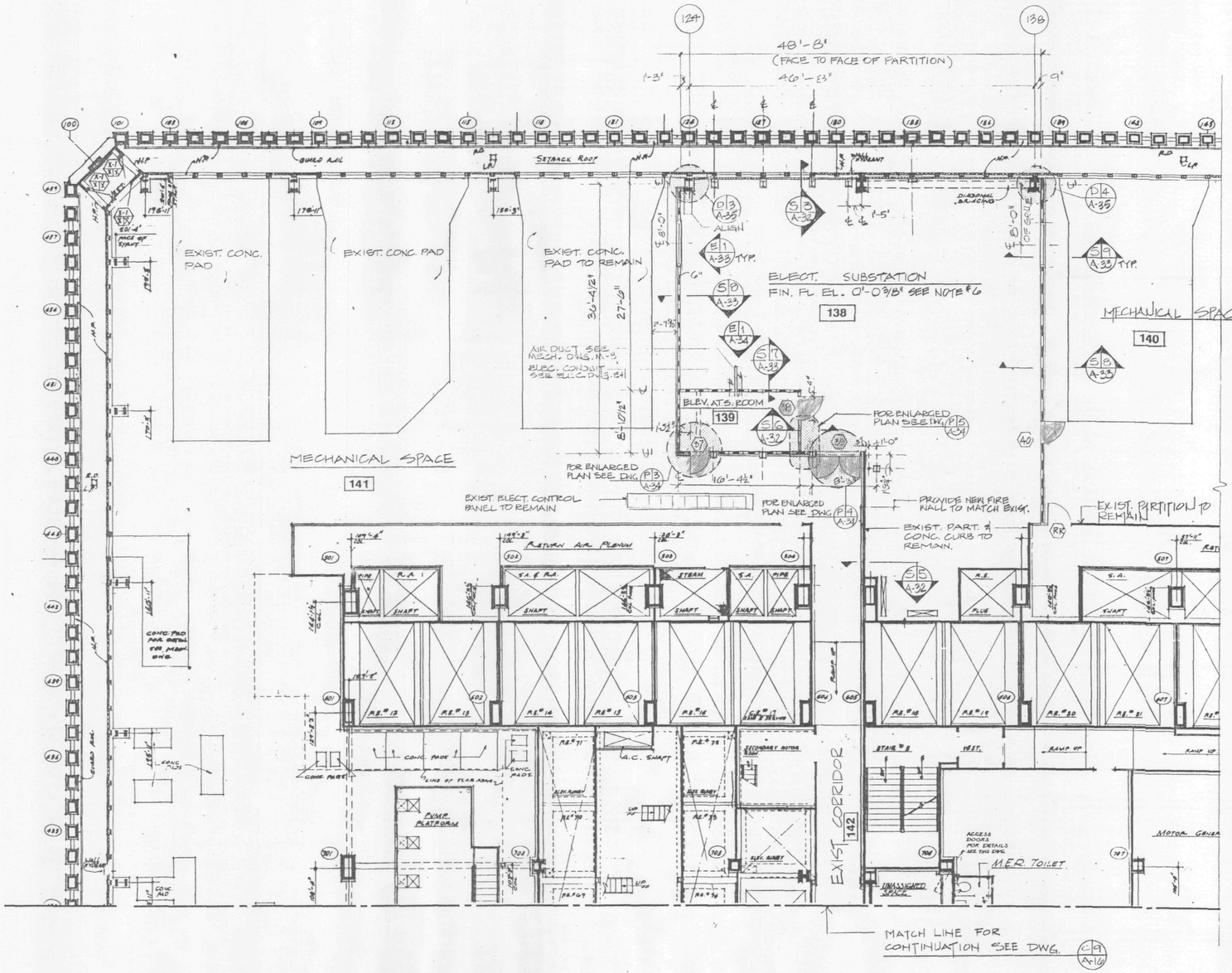
L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-18

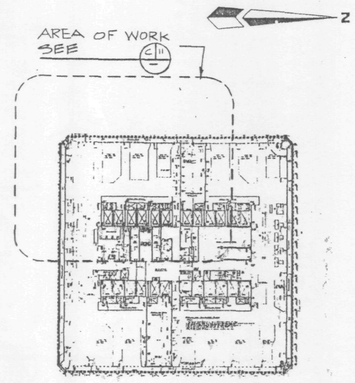


C 11 CONSTRUCTION PLAN

0 8 16
SCALE IN FEET

NOTES:

1. FOR GENERAL NOTES SEE NOTES NO. 2, 3 & 6 ON DWG T-4
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND & DWG. CONVENTIONS SEE DWG A-1
3. FOR PAINTING, SEE FINISH SCHEDULE.
4. FOR SUBSTATION CEILING LIGHTS LOCATION AND DETAILS SEE ELECTRICAL DWG. E-77
5. FOR AIR DUCT, LOUVER LOCATION AND DETAIL SEE MECHANICAL DWG. M-25
6. TOP OF ELECTRICAL SUBSTATIONS FINISH FLOOR ELEVATION NOTED (0'-0 3/8") WITH RESPECT ELEVATION 0'-0". DATUM (0'-0") IS EXISTING FINISH FLOOR ELEVATION AT SUBSTATION ROOM.



KEY PLAN

Sheet 24 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center
Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75W
TOWER TWO
75th FLOOR
CONSTRUCTION PLAN

CONFORMED
7/17/95

No.	Date	Revision	Approved

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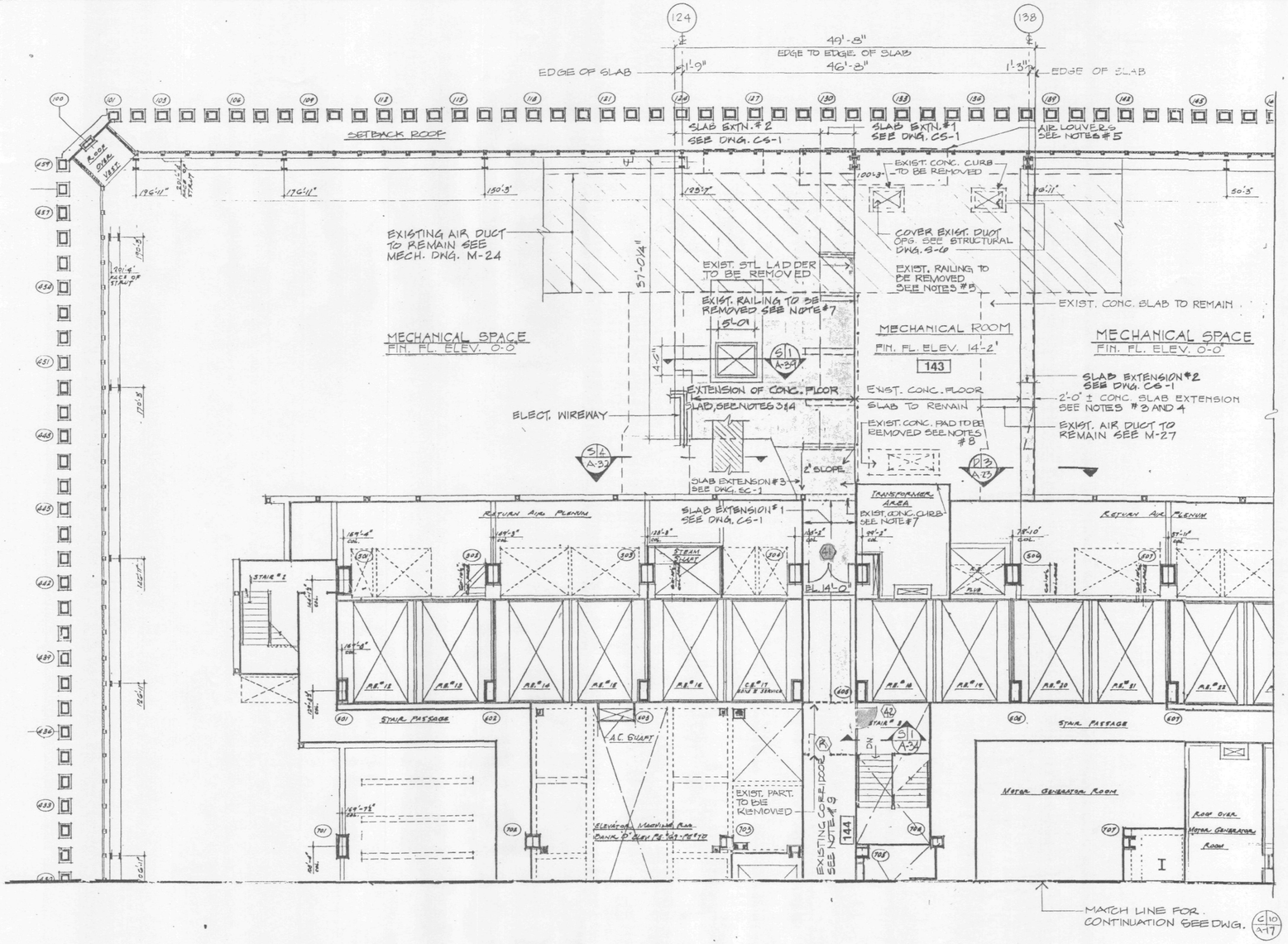
Designed by	Drawn by	Task Leader
L.V.G.	R.J.	L.V.G.

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-19

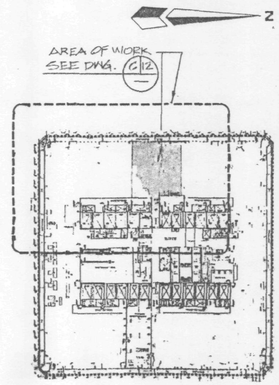


C12 CONSTRUCTION PLAN

SCALE IN FEET 0 8 16

NOTES:

1. FOR GENERAL NOTES, SEE NOTE NO. 2, 3, 6 AND 7 ON DWG. T-4.
2. FOR ARCHITECTURAL NOTES, ABBREVIATIONS, LEGEND AND DRAWING CONVENTIONS, SEE DRAWING A-1
3. THE CONTRACTOR SHALL ALIGN EXTENSION OF CONCRETE SLAB ELEVATION WITH ADJACENT EXISTING CONCRETE FLOOR ELEVATION.
4. FOR CONCRETE SLAB EXTENSION AND DETAILS, SEE STRUCTURAL DWG. S-6.
5. FOR AIR DUCT, LOUVER LOCATION AND DETAILS, SEE MECHANICAL DWG. M-25
6. FOR MECHANICAL ROOM CEILING LIGHTS LOCATION AND DETAILS, SEE ELECTRICAL DWG. E-67.
7. THE CONTRACTOR SHALL REMOVE EXISTING CONCRETE CURB AND STEEL RAILING; PATCH UP ANY DAMAGED FINISH TO MATCH EXISTING ADJACENT FLOOR SLAB.
8. EXISTING CONCRETE PAD TO BE REMOVED AND EXISTING OPENING TO BE COVERED SEE STRUCTURAL DWG.
9. FOR EXISTING CORRIDOR CEILING PLAN SEE DWG. A-29



KEY PLAN

Sheet 25 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75W
TOWER TWO
76th FLOOR
CONSTRUCTION/REMOVAL PLAN

CONFORMED
7/17/95

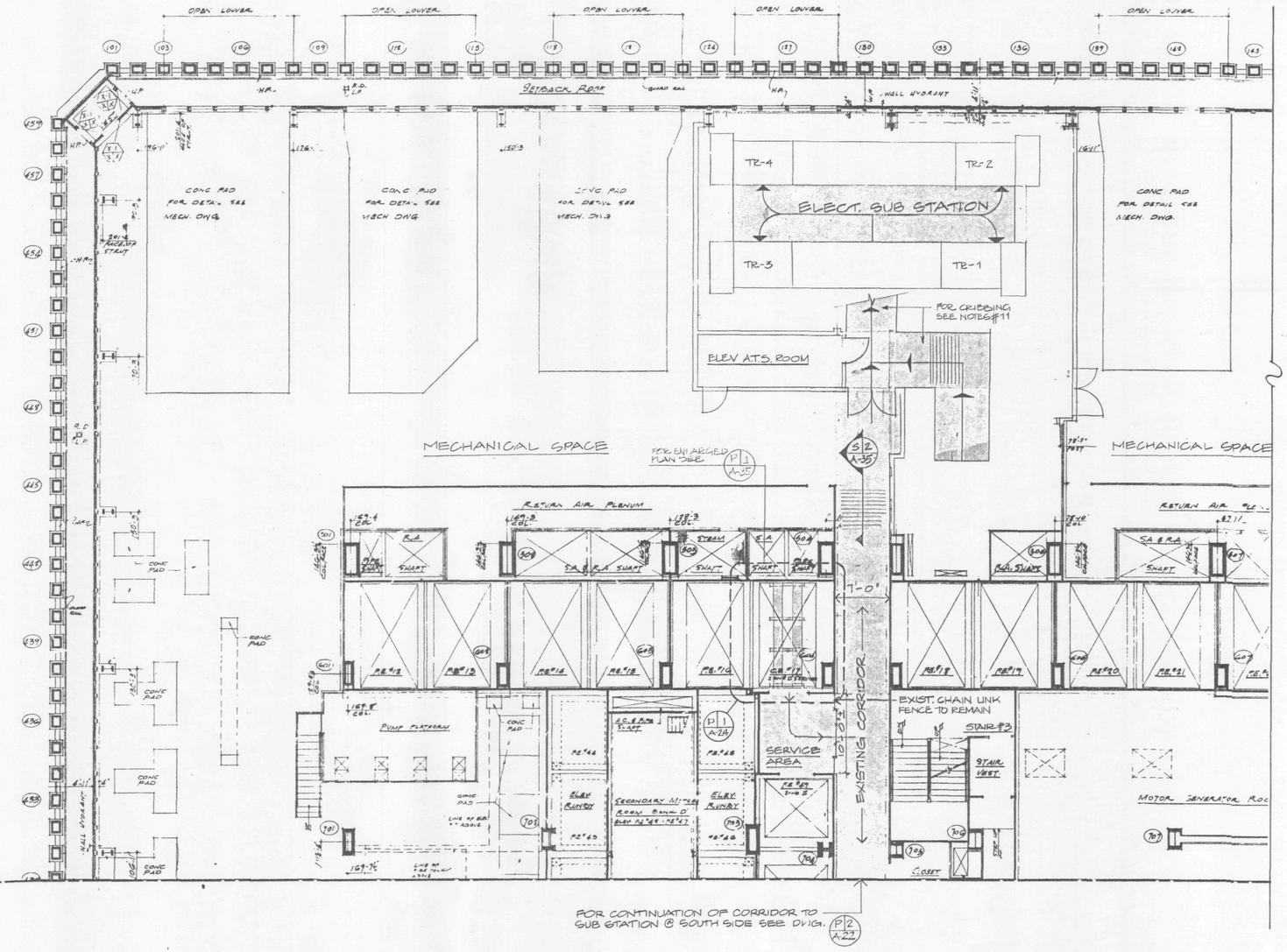
No. Date Revision Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-20



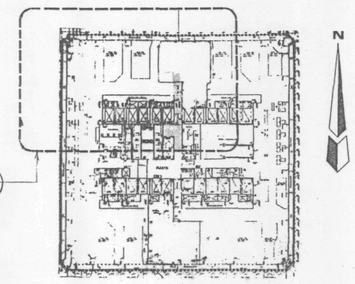
P 1 **ROUTING PLAN**

0 8 16
SCALE IN FEET

ROUTING AND CRIBBING NOTES:

1. THE LOCATION OF THE ELECTRICAL EQUIPMENT ON THE FLOORS SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE MOVED FROM THE TRUCK TO THE ELEVATOR AND TO THEIR FINAL PLACEMENT LOCATION ON THE FLOORS ON WHEELED CARRIAGES MOVING IN A CONTINUOUS NON-SLIP MANNER VIA THE DESIGNATED ROUTE (SHOWN SHADED ON PLANS).

   CRIBBING AS DETAILED ON THE CONTRACT DRAWINGS SHALL BE PLACED ON THE ROUTE SLAB AND THE EQUIPMENT CARRIAGE SHALL BE ROLLED ON IT. THE EQUIPMENT SHALL BE LIFTED DIRECTLY FROM THE CARRIAGE TO THE SUPPORT FRAMES ON PADS IN THE FINAL LOCATION WITHOUT PLACING IT AT ANY OTHER LOCATION ON THE FLOOR.
3. NO AREA WITHIN THE WORLD TRADE CENTER SUB GRADE LEVEL OR ON THE FLOORS SHALL BE USED FOR THE PURPOSE OF EQUIPMENT STORAGE WITHOUT THE APPROVAL OF THE ENGINEER.
4. A FORKLIFT SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
5. THE CARRIAGE DETAIL WITH NUMBER AND GAUGE OF WHEELS SHALL BE SUBMITTED FOR APPROVAL.
6. CRIBBING SHALL BE REQUIRED ON ALL FLOOR SLABS FOR MOVING TRANSFORMERS AND ANY OTHER EQUIPMENT WEIGHING MORE THAN 3,500 LBS.
7. CRIBBING REQUIRED FOR TRANSFER OF TRANSFORMER SHALL BE COORDINATED WITH MANUFACTURER. CONTRACTOR SHALL COMPLY WITH MANUFACTURER'S REQUIREMENTS BEFORE MOVING ANY TRANSFORMER EQUIPMENT.
8. FOR INFORMATION RELATING TO THE LOCATION AND ARRANGEMENT OF TRANSFORMERS, TRANSFORMER BASES AND ALL OTHER ELECTRICAL EQUIPMENT AT SUBSTATION ROOM, SEE ELECTRICAL DRAWINGS.
9. THE CONTRACTOR SHALL USE A CRANE MAT OR OTHER ALTERNATE METHOD FOR CRIBBING OVER SLAB WITH THE APPROVAL OF THE ENGINEER.
10. TIMBER CONSTRUCTION : (SEE NOTES #1 ON DWG. A-1)
    A. ALL LUMBER DIMENSIONS SHOWN ARE NOMINAL.
    B. ALL LUMBER SHALL BE "DOUGLAS FIR SOUTH" OR APPROVED EQUAL:
       16" X 4" BEAMS - SELECT STRUCTURAL. WITH MIN. Fb = 1700 PSI, E = 1400 PSI, 4" BLOCKING-GRADE NO.1
    C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
11. CRIBBING INSIDE THE SUBSTATIONS SHALL BE CONTINUOUS AS REQUIRED AND SHALL BE COORDINATED WITH THE MANUFACTURER AS SHOWN ON NOTE # 7



KEY PLAN

Sheet 26 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41N
TOWER ONE
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

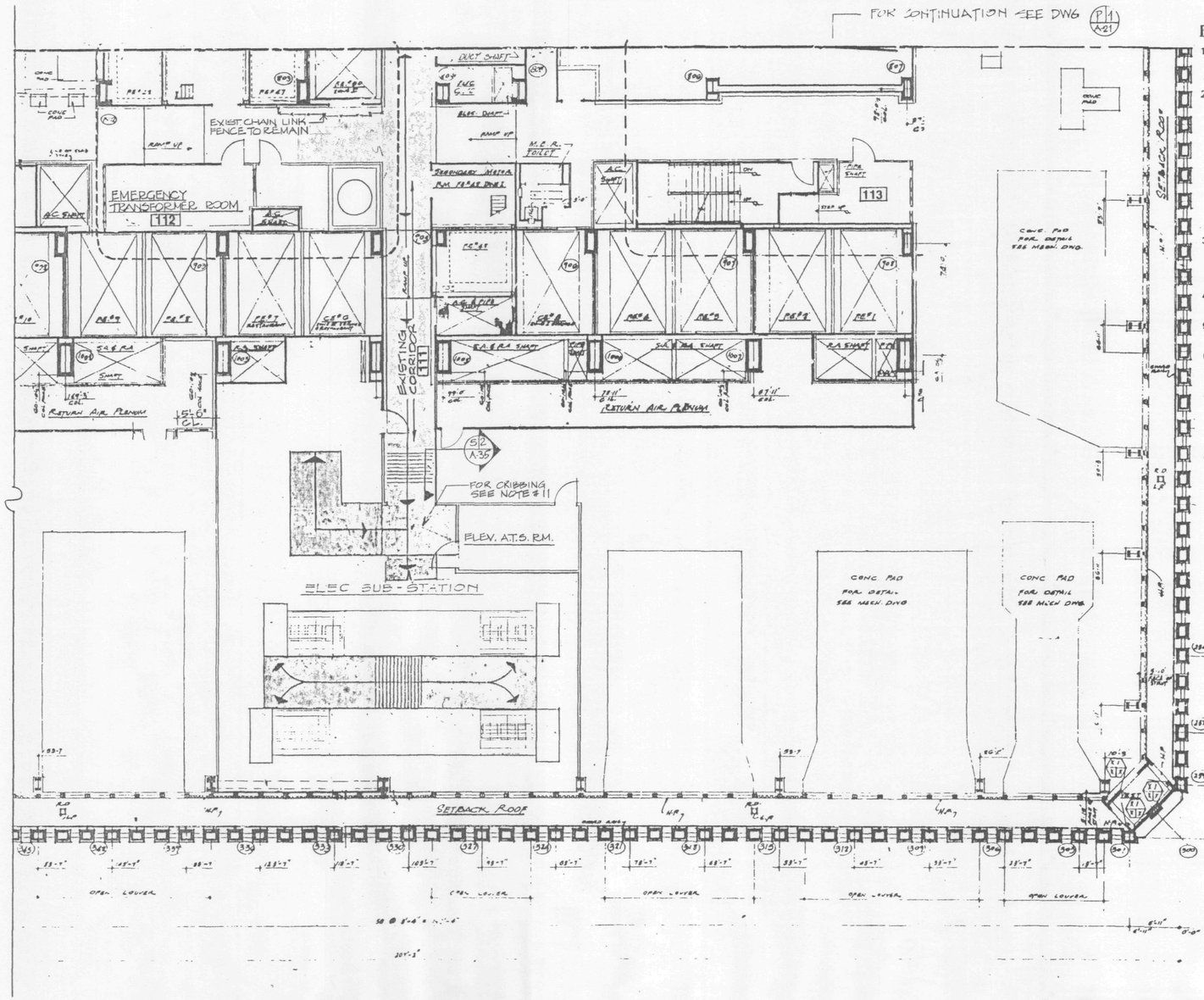
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent. S. Yudko

A.T.S. L.V.G.	D.D. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-21

CHARRETTE



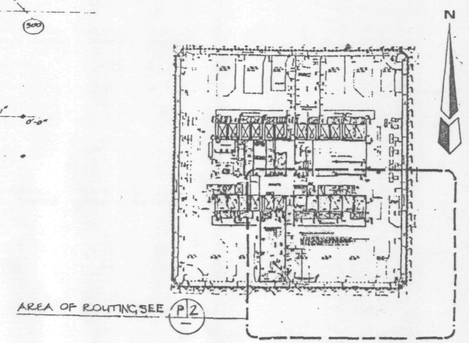
P2 ROUTING PLAN

0 8 16
SCALE IN FEET

ROUTING AND CRIBBING NOTES:

1. THE LOCATION OF THE ELECTRICAL EQUIPMENT ON THE FLOORS SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE MOVED FROM THE TRUCK TO THE ELEVATOR AND TO THEIR FINAL PLACEMENT LOCATION ON THE FLOORS ON WHEELED CARRIAGES MOVING IN A CONTINUOUS NON-SLIP MANNER VIA THE DESIGNATED ROUTE (SHOWN SHADED ON PLANS).

   CRIBBING AS DETAILED ON THE CONTRACT DRAWINGS SHALL BE PLACED ON THE ROUTE SLAB AND THE EQUIPMENT CARRIAGE SHALL BE ROLLED ON IT. THE EQUIPMENT SHALL BE LIFTED DIRECTLY FROM THE CARRIAGE TO THE SUPPORT FRAMES ON PADS IN THE FINAL LOCATION WITHOUT PLACING IT AT ANY OTHER LOCATION ON THE FLOOR.
3. NO AREA WITHIN THE WORLD TRADE CENTER SUB GRADE LEVEL OR ON THE FLOORS SHALL BE USED FOR THE PURPOSE OF EQUIPMENT STORAGE WITHOUT THE APPROVAL OF THE ENGINEER.
4. A FORKLIFT SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
5. THE CARRIAGE DETAIL WITH NUMBER AND GAUGE OF WHEELS SHALL BE SUBMITTED FOR APPROVAL.
6. CRIBBING SHALL BE REQUIRED ON ALL FLOOR SLABS FOR MOVING TRANSFORMERS AND ANY OTHER EQUIPMENT WEIGHING MORE THAN 3,500 LBS.
7. CRIBBING REQUIRED FOR TRANSFER OF TRANSFORMER SHALL BE COORDINATED WITH MANUFACTURER. CONTRACTOR SHALL COMPLY WITH MANUFACTURER'S REQUIREMENTS BEFORE MOVING ANY TRANSFORMER EQUIPMENT.
8. FOR INFORMATION RELATING TO THE LOCATION AND ARRANGEMENT OF TRANSFORMERS, TRANSFORMER BASES AND ALL OTHER ELECTRICAL EQUIPMENT AT SUBSTATION ROOM, SEE ELECTRICAL DRAWINGS.
9. THE CONTRACTOR SHALL USE A CRANE MAT OR OTHER ALTERNATE METHOD FOR CRIBBING OVER SLAB WITH THE APPROVAL OF THE ENGINEER.
10. TIMBER CONSTRUCTION : (SEE NOTES #1 ON DWG. A-1)
    - A. ALL LUMBER DIMENSIONS SHOWN ARE NOMINAL.
    - B. ALL LUMBER SHALL BE "DOUGLAS FIR SOUTH" OR APPROVED EQUAL:
      16" X 4" BEAMS - SELECT STRUCTURAL. WITH MIN. Fb=1700 PSI, E=1400 PSI, 4" BLOCKING-GRADE NO.1
    - C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
11. CRIBBING INSIDE THE SUBSTATIONS SHALL BE CONTINUOUS AS REQUIRED AND SHALL BE COORDINATED WITH THE MANUFACTURER AS SHOWN ON NOTE #7



KEY PLAN

Sheet 27 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 41S
TOWER ONE
ROUTING PLAN

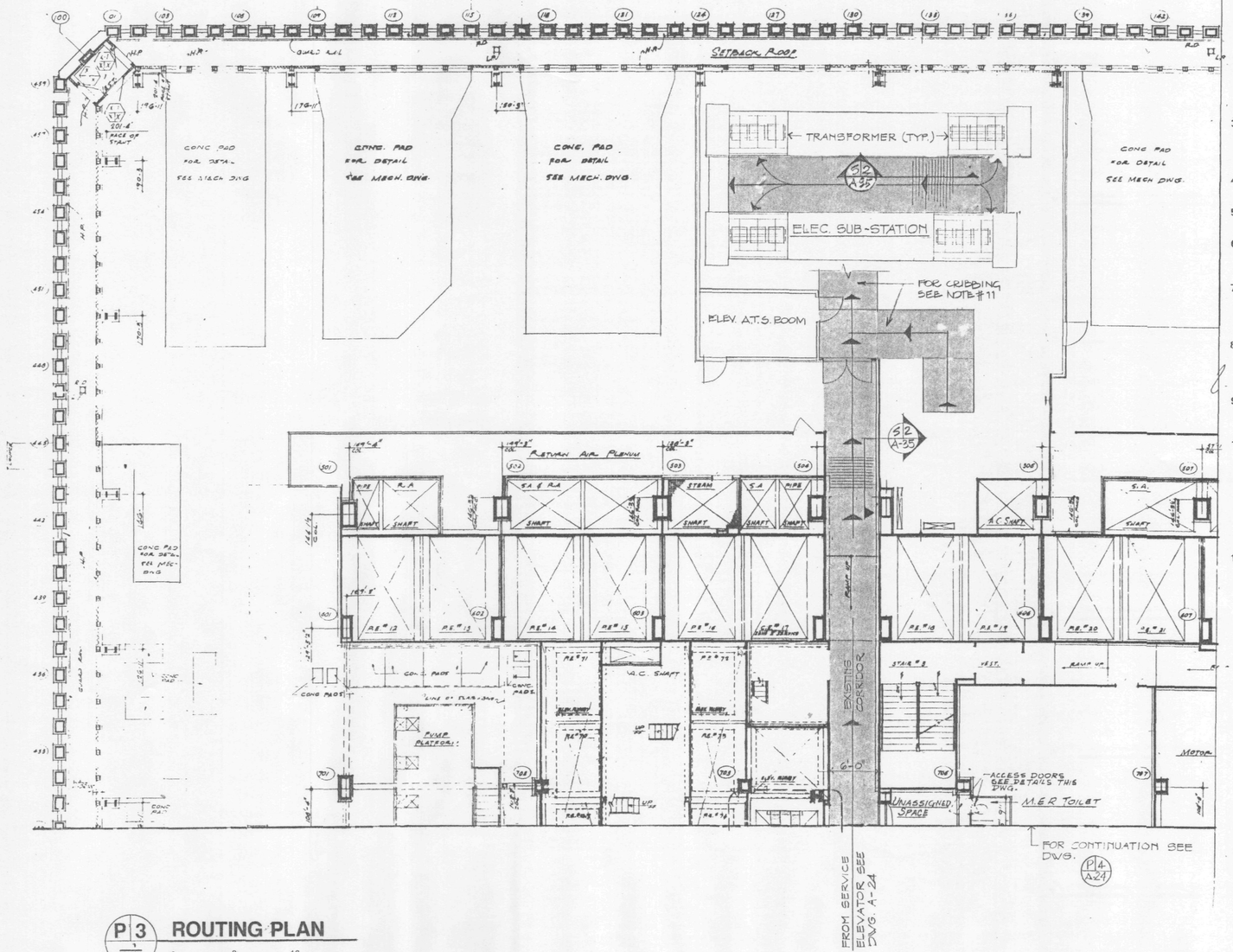
CONFORMED

No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

A.T.S. L.V.G. — Designed by
D.D. A.T.S. — Drawn by
L.V.G. — Task Leader
PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-22



P 3 **ROUTING PLAN**

0 8 16
SCALE IN FEET

ROUTING AND CRIBBING NOTES:

1. THE LOCATION OF THE ELECTRICAL EQUIPMENT ON THE FLOORS SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE MOVED FROM THE TRUCK TO THE ELEVATOR AND TO THEIR FINAL PLACEMENT LOCATION ON THE FLOORS ON WHEELED CARRIAGES MOVING IN A CONTINUOUS NON-SLIP MANNER VIA THE DESIGNATED ROUTE (SHOWN SHADED ON PLANS).

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3. NO AREA WITHIN THE WORLD TRADE CENTER SUB GRADE LEVEL OR ON THE FLOORS SHALL BE USED FOR THE PURPOSE OF EQUIPMENT STORAGE WITHOUT THE APPROVAL OF THE ENGINEER.
4. A FORKLIFT SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
5. THE CARRIAGE DETAIL WITH NUMBER AND GAUGE OF WHEELS SHALL BE SUBMITTED FOR APPROVAL.
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7. CRIBBING REQUIRED FOR TRANSFER OF TRANSFORMER SHALL BE COORDINATED WITH MANUFACTURER. CONTRACTOR SHALL COMPLY WITH MANUFACTURER'S REQUIREMENTS BEFORE MOVING ANY TRANSFORMER EQUIPMENT.
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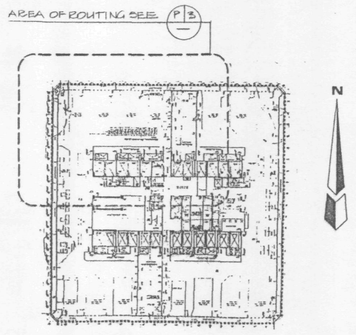
    B. ALL LUMBER SHALL BE "DOUGLAS FIR SOUTH" OR APPROVED EQUAL:
       16" X 4" BEAMS - SELECT STRUCTURAL. WITH MIN. Fb = 1700 PSI, E = 1400 PSI, 4" BLOCKING-GRADE NO.1
    C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
11. CRIBBING INSIDE THE SUBSTATIONS SHALL BE CONTINUOUS AS REQUIRED AND SHALL BE COORDINATED WITH THE MANUFACTURER AS SHOWN ON NOTE # 7



KEY PLAN

Sheet 28 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER, WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75N
TOWER ONE
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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A.T.S. L.V.G. | D.D. A.T.S. | L.V.G.

Designed by | Drawn by | Task Leader

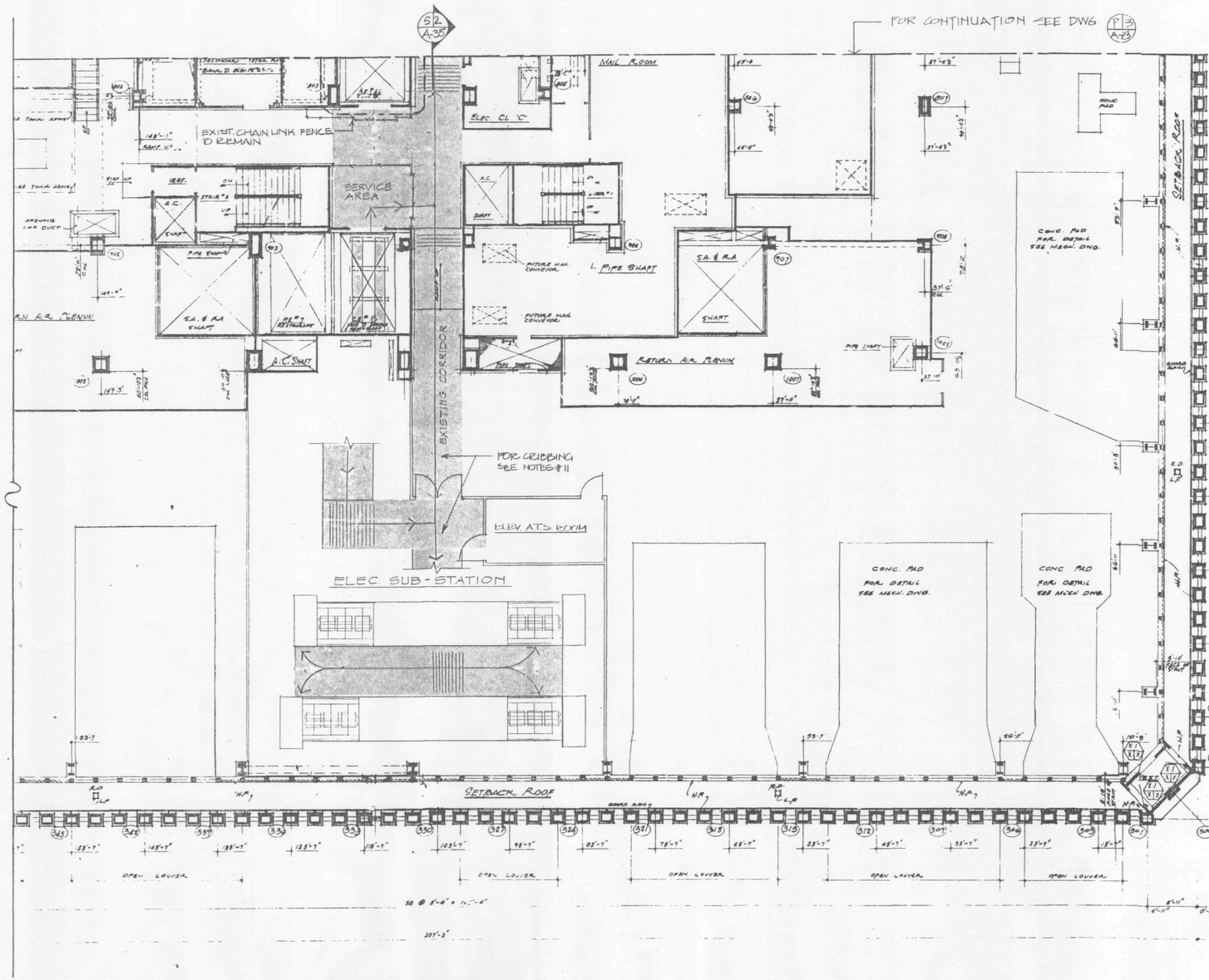
PRINCIPAL ARCHITECT

Date 5/1/95

Scale AS NOTED

Contract Number: WTC-802.071

Drawing Number: A-23



P4 — ROUTING PLAN

0 8 16

SCALE IN FEET

ROUTING AND CRIBBING NOTES:

1. THE LOCATION OF THE ELECTRICAL EQUIPMENT ON THE FLOORS SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.
2. ALL ELECTRICAL EQUIPMENT SHALL BE MOVED FROM THE TRUCK TO THE ELEVATOR AND TO THEIR FINAL PLACEMENT LOCATION ON THE FLOORS ON WHEELED CARRIAGES MOVING IN A CONTINUOUS NON-SLIP MANNER VIA THE DESIGNATED ROUTE (SHOWN SHADED ON PLANS).

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3. NO AREA WITHIN THE WORLD TRADE CENTER SUB GRADE LEVEL OR ON THE FLOORS SHALL BE USED FOR THE PURPOSE OF EQUIPMENT STORAGE WITHOUT THE APPROVAL OF THE ENGINEER.
4. A FORKLIFT SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
5. THE CARRIAGE DETAIL WITH NUMBER AND GAUGE OF WHEELS SHALL BE SUBMITTED FOR APPROVAL.
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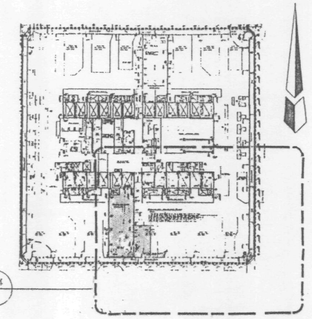
    - B. ALL LUMBER SHALL BE "DOUGLAS FIR SOUTH" OR APPROVED EQUAL: 16" X 4" BEAMS - SELECT STRUCTURAL. WITH MIN. Fb = 1700 PSI, E = 1400 PSI, 4" BLOCKING-GRADE NO.1
    - C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
11. CRIBBING INSIDE THE SUBSTATIONS SHALL BE CONTINUOUS AS REQUIRED AND SHALL BE COORDINATED WITH THE MANUFACTURER AS SHOWN ON NOTE #7



KEY PLAN

Sheet 29 Of 224

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75S
TOWER ONE
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

A.T.S. L.V.G.	D.D. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader

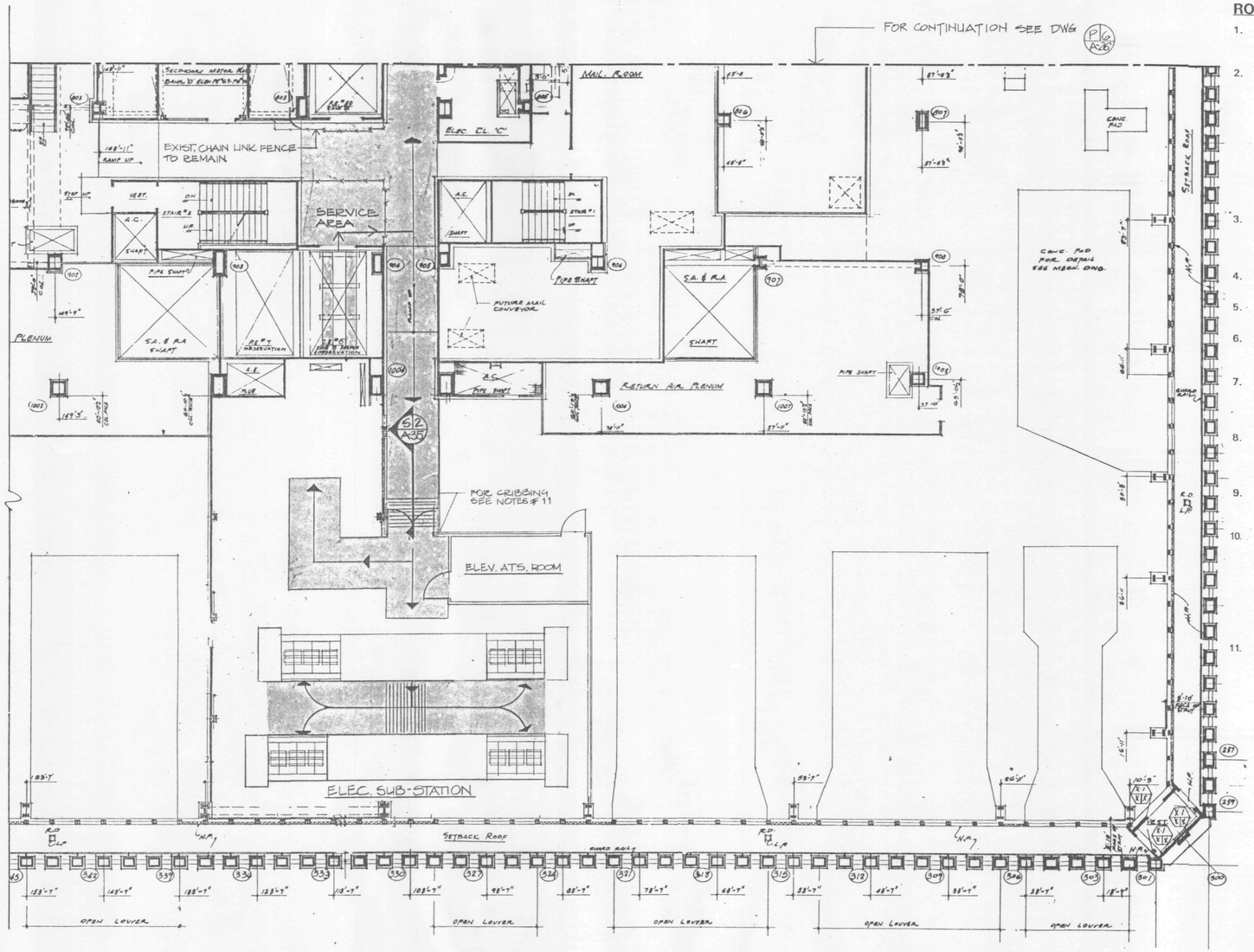
PRINCIPAL ARCHITECT

Date 5/1/95

Scale AS NOTED

Contract Number WTC-802.071

Drawing Number A-24



P5 ROUTING PLAN

0 8 16
SCALE IN FEET

ROUTING AND CRIBBING NOTES:

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    - B. ALL LUMBER SHALL BE "DOUGLAS FIR SOUTH" OR APPROVED EQUAL: 16" X 4" BEAMS - SELECT STRUCTURAL. WITH MIN. Fb = 1700 PSI, E = 1400 PSI, 4" BLOCKING-GRADE NO.1
    - C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
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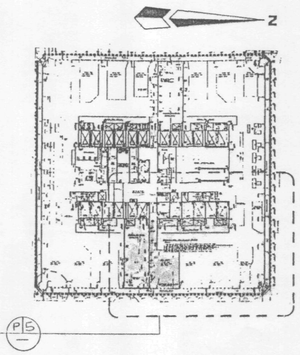

KEY PLAN

Sheet 30 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75E
TOWER TWO
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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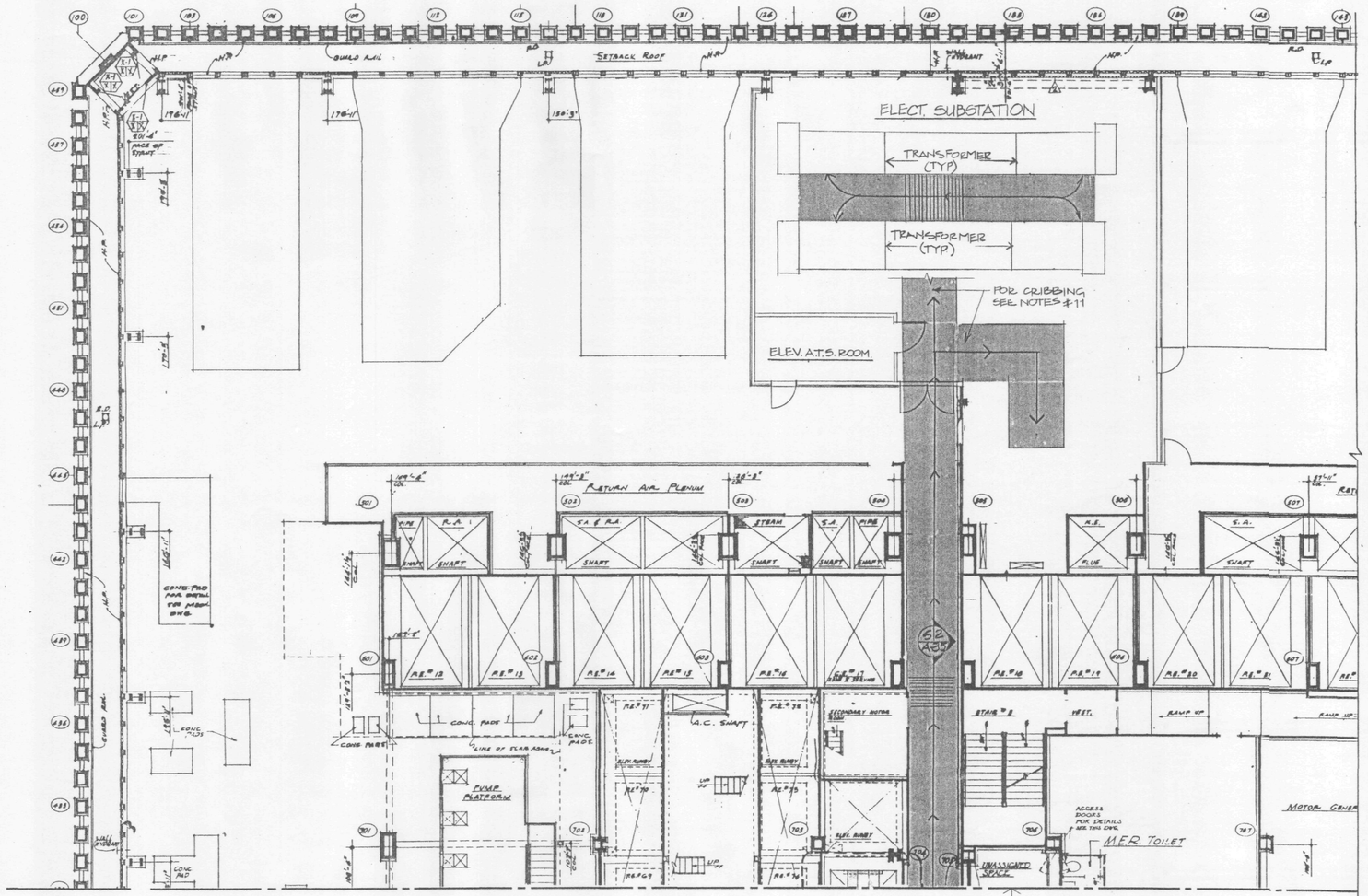
A.T.S. L.V.G.	D.D. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader
PRINCIPAL ARCHITECT		
Date 5/1/95	Scale AS NOTED	

Contract Number WTC-802.071
Drawing Number A-25



P6 ROUTING PLAN

0 8 16
SCALE IN FEET

ROUTING AND CRIBBING NOTES:

1. THE LOCATION OF THE ELECTRICAL EQUIPMENT ON THE FLOORS SHALL NOT BE CHANGED WITHOUT THE APPROVAL OF THE ENGINEER.
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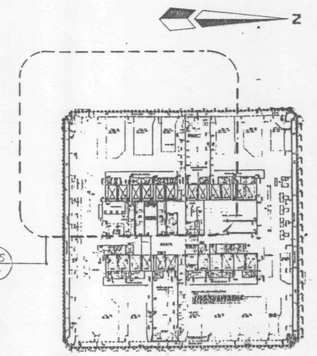
    - C. FOR ADDITONAL INFORMATION AND REQUIREMENTS, SEE SPEC. 06100.
11. CRIBBING INSIDE THE SUBSTATIONS SHALL BE CONTINUOUS AS REQUIRED AND SHALL BE COORDINATED WITH THE MANUFACTURER AS SHOWN ON NOTE #7

AREA OF ROUTING SEE P6



KEY PLAN

Sheet 31 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75W
TOWER TWO
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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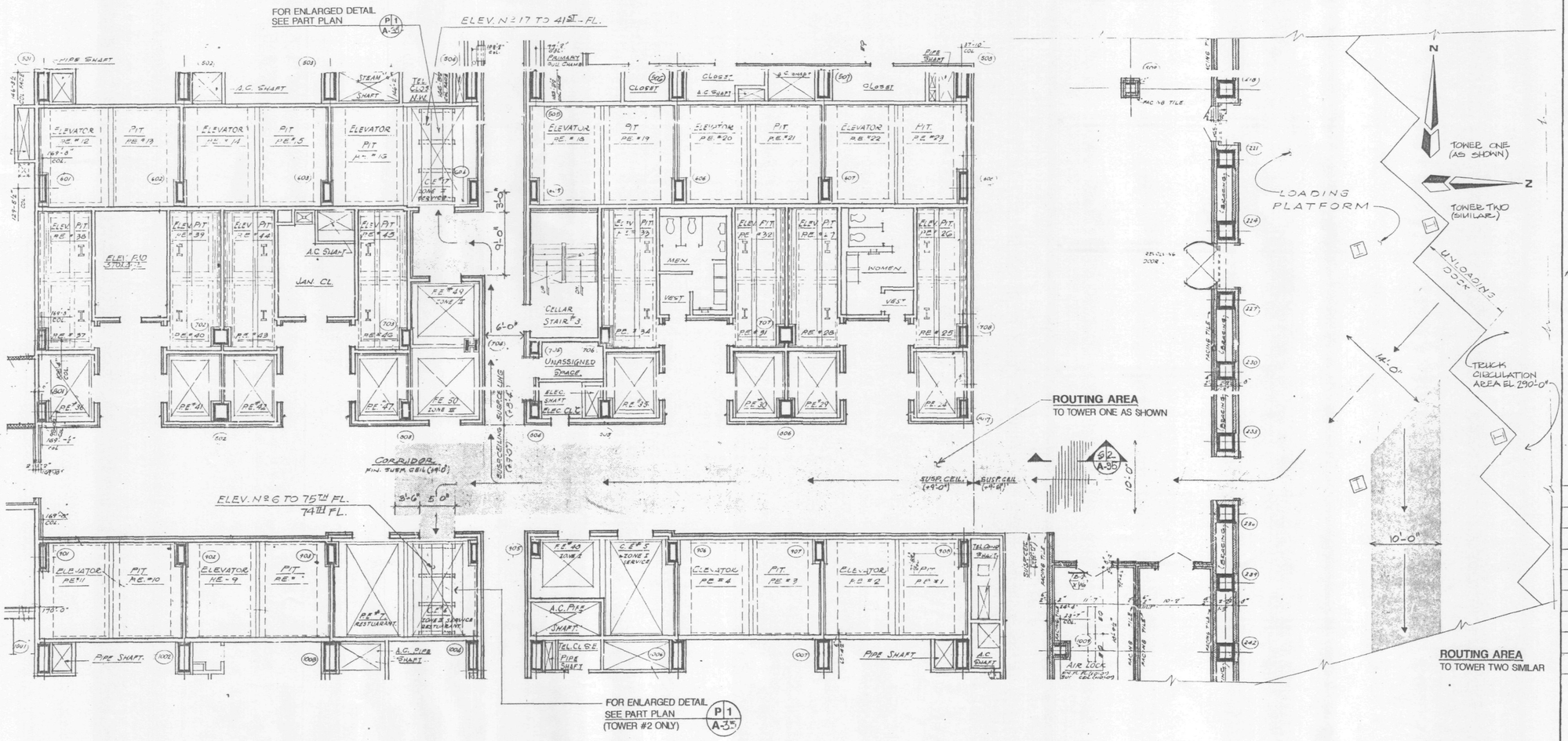
A.T.S. L.V.G.	A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-26

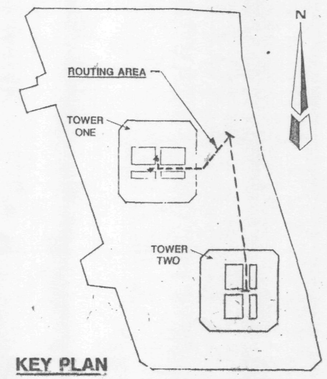


P7 ROUTING PLAN — P8 SIMILAR TOWER TWO

0 8 16
SCALE IN FEET

NOTES:

1. FOR ROUTING AND CRIBBING NOTES, SEE DWG. A-21
2. FOR INFORMATION RELATING TO LOCATION AND ARRANGEMENT OF TRANSFORMERS, TRANSFORMER BASES AND ALL OTHER ELECTRICAL EQUIPMENT AT SUBSTATION ROOM, SEE ELECTRICAL DRAWINGS.
3. FOR CRIBBING AT ALL ROUTING AREA SHOWN SHADED ON PLAN, SEE DETAIL ON DWG. NO. A-35
4. FOR SIZE AND CLEARANCE OF EXISTING W.T.C. ELEVATORS #6 AND #17 SEE PART PLAN ON DWG. A-35 AND E-107



KEY PLAN

Sheet 32 of 224

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
TOWER ONE EL. 294'-0"
ROUTING PLAN

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

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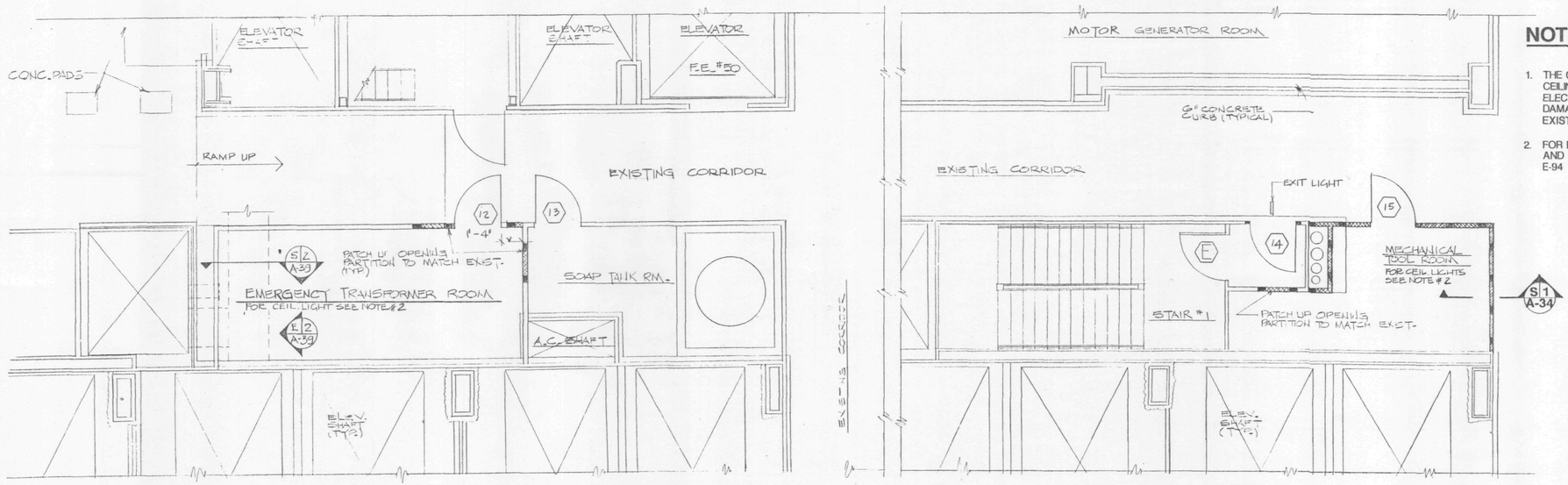
L. V. GALAN	J. SCRIMENTI	L. V. GALAN
S. YADOO		S. YADOO
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95
Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-27

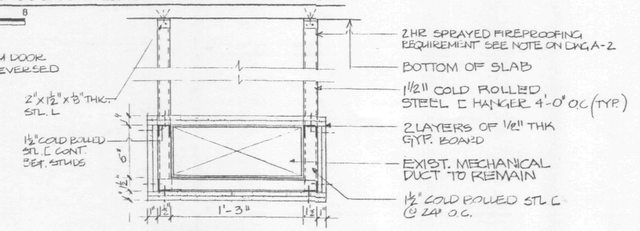


P/1 ENLARGED PART PLAN AT 41ST FLOOR

SCALE IN FEET

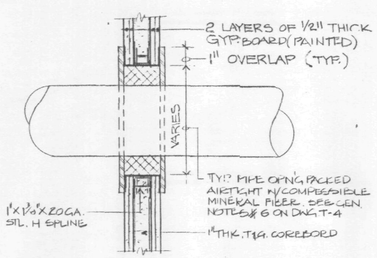
P/2 ENLARGED PART PLAN AT 41ST FLOOR

SCALE IN FEET



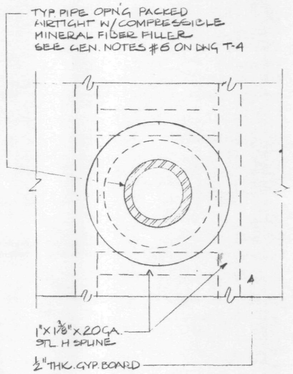
D/1 SECTION AT AIR DUCT ENCLOSURE

SCALE IN FEET



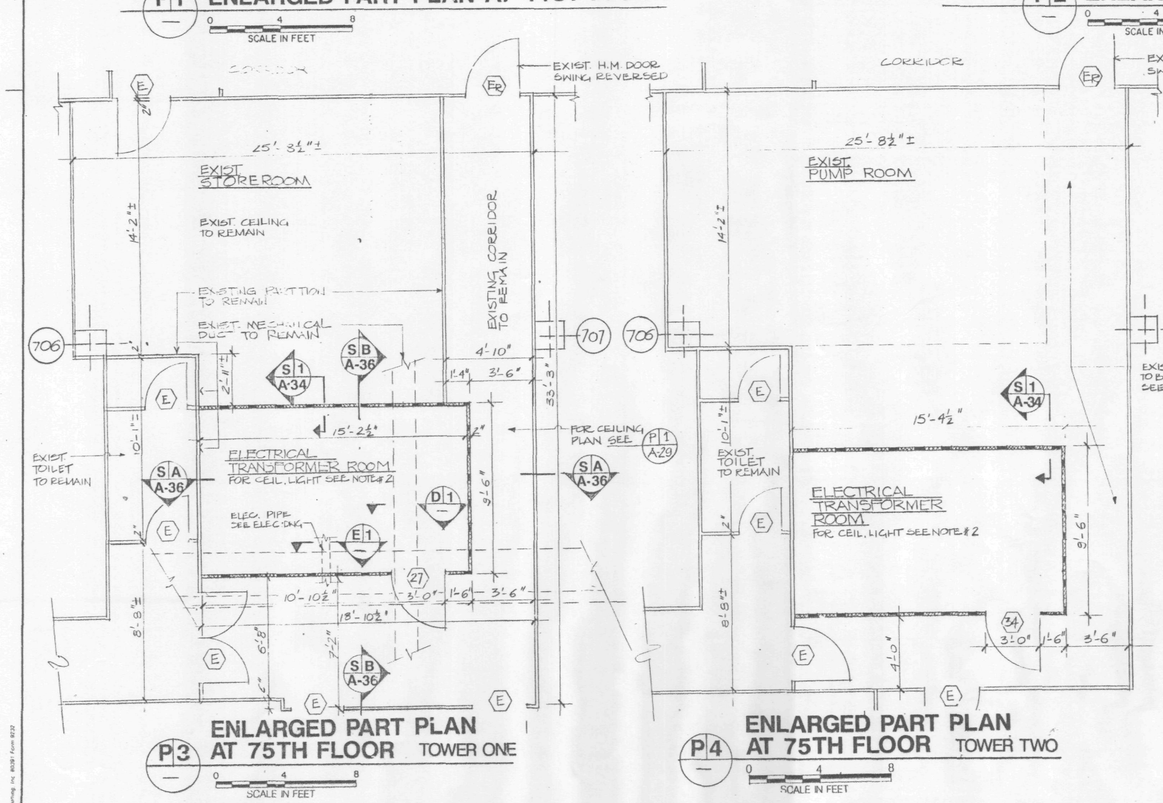
S/3 SECTION THRU GYPSUM BOARD PART. PENETRATION

SCALE IN FEET



E/1 ELEVATION OF TYP. PIPE PENETRATION

SCALE IN FEET



P/3 ENLARGED PART PLAN AT 75TH FLOOR TOWER ONE

SCALE IN FEET

P/4 ENLARGED PART PLAN AT 75TH FLOOR TOWER TWO

SCALE IN FEET

NOTES:

1. THE CONTRACTOR SHALL REMOVE EXISTING CEILING TILES, SUSPENSION SYSTEM AND ELECTRICAL LIGHT FIXTURES AND PATCH-UP DAMAGED AREAS AS REQUIRED TO MATCH EXISTING CEILING.
2. FOR ELECTRICAL LIGHT FIXTURES LOCATION AND DETAIL SEE ELECT. DWG. # E-93 AND E-94

Sheet 33 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL

SUBSTATION - SS 41 AND 75 TOWER ONE AND TWO ENLARGED PART PLANS, SECTIONS AND DETAILS

CONFORMED
7/17/95

No	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	Task Leader
A.T.SOLAWA G.FARLEY	A.T.S. G.FARLEY	L.GALANG

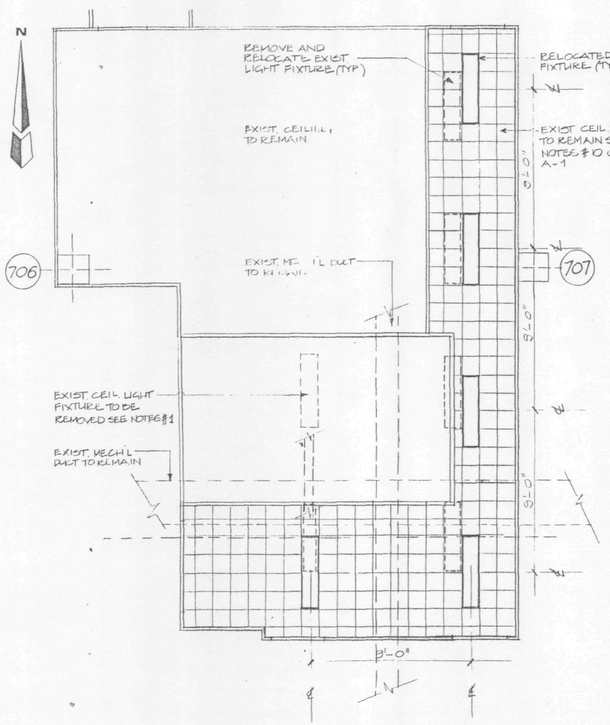
PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-28

Dux Blueline, Inc. 80130 Form 8232

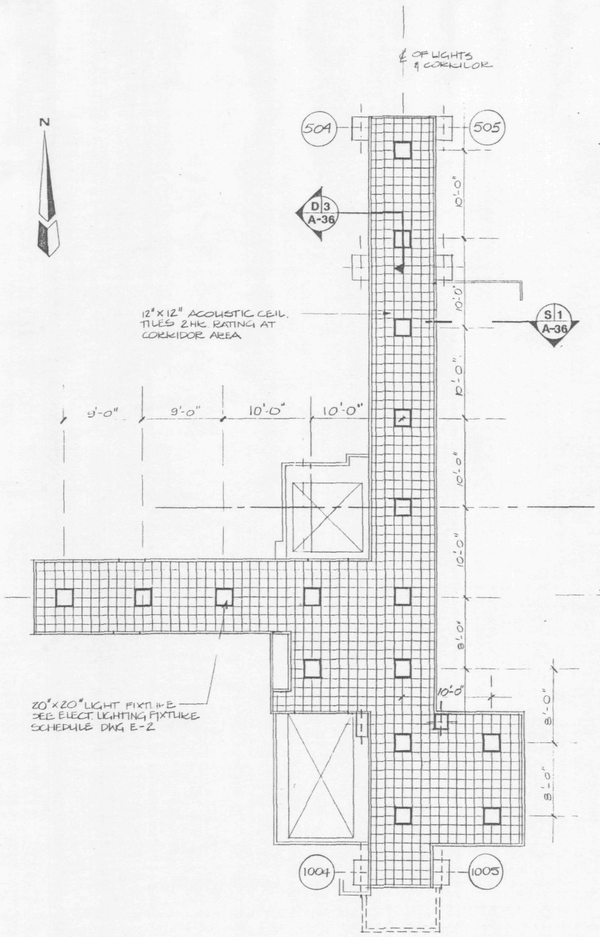
NOTES:

1. THE CONTRACTOR SHALL REMOVE EXISTING CEILING TILES, SUSPENSION SYSTEM, LIGHT FIXTURE AND SPRINKLER IN THE TRANSFORMER ROOM.
2. FOR TRANSFORMER ROOM CEILING LIGHT FIXTURE LOCATION AND DETAIL SEE ELECTRICAL DWG. E-94
3. FOR EXISTING ACOUSTIC CEILING TILES SEE NOTE #10 ON DWG. A-1



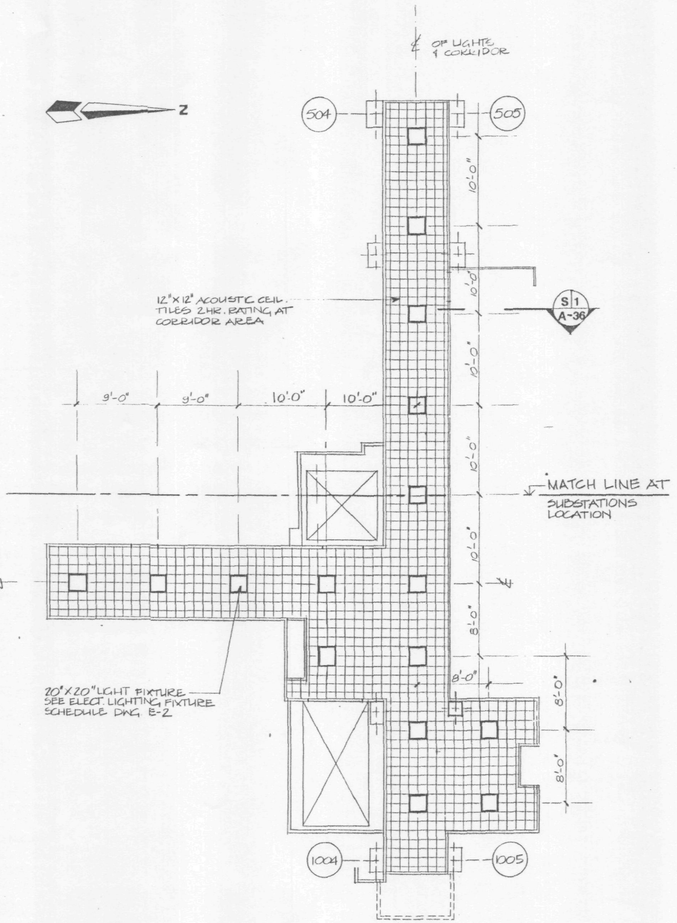
P1 / A-28 PART REFLECTED CEILING PLAN AT 75th FLOOR TOWER ONE

0 4 8 SCALE IN FEET



P2 / — REFLECTED CEILING PLAN AT 76th FLOOR TOWER ONE

0 8 16 SCALE IN FEET



P3 / — REFLECTED CEILING PLAN AT 76th FLOOR TOWER TWO

0 8 16 SCALE IN FEET

Sheet 34 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

for
CHIEF ARCHITECT

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75 AND 76
TOWERS ONE AND TWO
REFLECTED CEILING PLANS

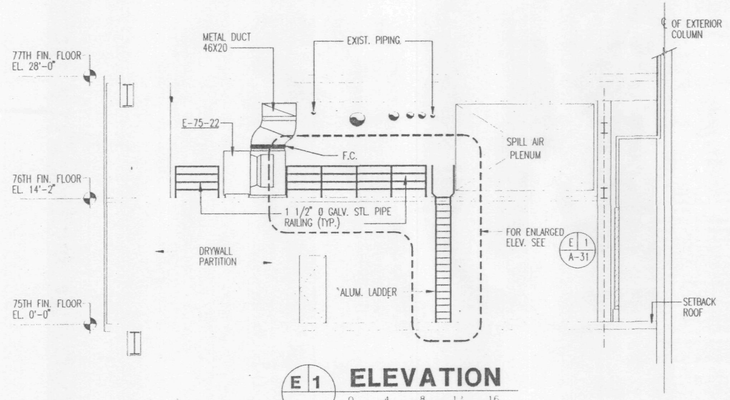
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

A.T.SOLAWA	A.T.S.	L.V.GALAN
Designed by	Drawn by	Task Leader

Principal Architect

Date 5/1/95 Scale AS NOTED

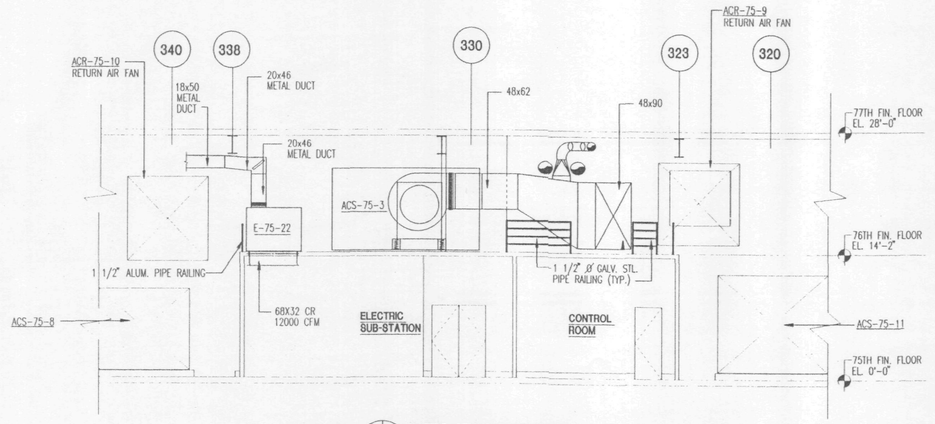
Contract Number WTC-802.071 Drawing Number A-29



E 1 **ELEVATION**

0 4 8 12 16

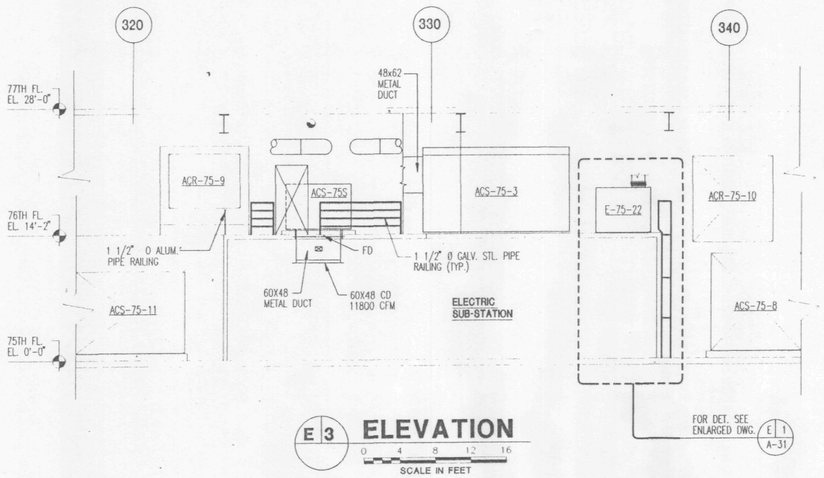
SCALE IN FEET



E 2 **ELEVATION**

0 4 8 12 16

SCALE IN FEET



E 3 **ELEVATION**

0 4 8 12 16

SCALE IN FEET

NOTE :

1. FOR METAL DUCT LOCATION AND DETAIL SEE MECHANICAL DWG. M-8.
2. FOR ELECTRICAL LIGHTING FIXTURES LOCATION AND DETAIL SEE ELECT-DWG E-45 AND E-48

Sheet 35 Of 224

THE PORT AUTHORITY
OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
SUBSTATION - SS 75S
TOWER ONE
RAILING AND LADDER
ELEVATIONS

CONFORMED
7/17/95

No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

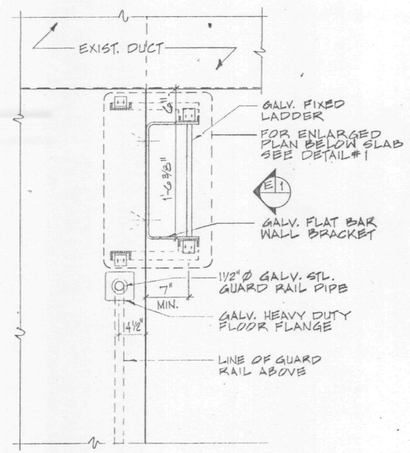
D.GALANG	G.FARLEY	D.GALANG
Designed by	Drawn by	Task Leader

Principal Architect

Date 5/1/95 Scale AS SHOWN

Contract Number Drawing Number

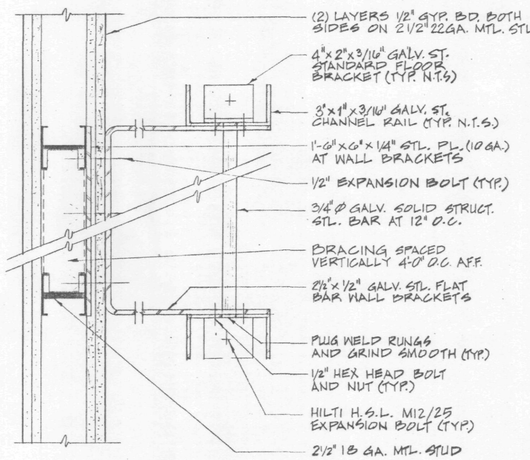
WTC-802.071 A-30



P1 — PLAN OF MECHANICAL ROOM LADDER

0 1 2 3 4

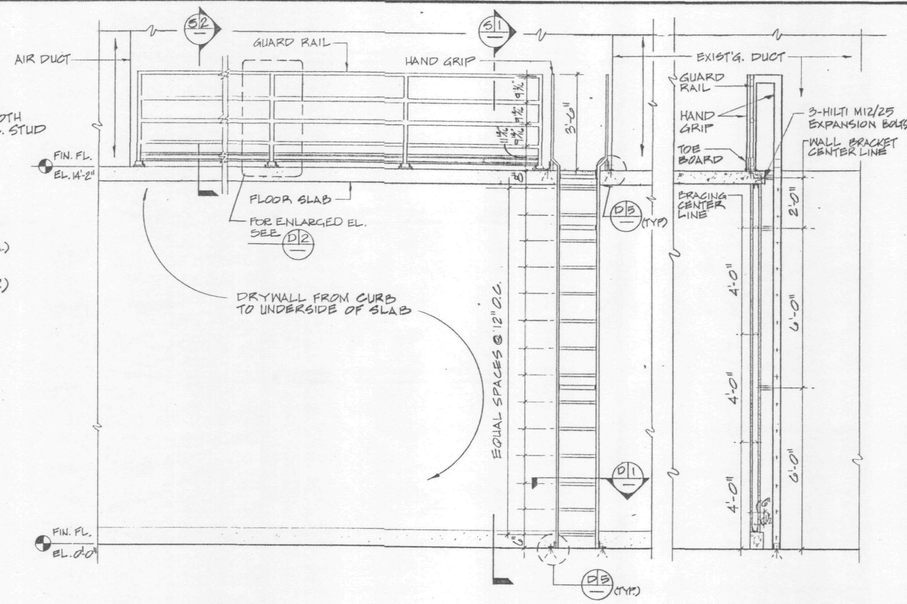
SCALE IN FEET



D1 — LADDER DETAIL

0 1

SCALE IN FEET



E1 — ELEVATION

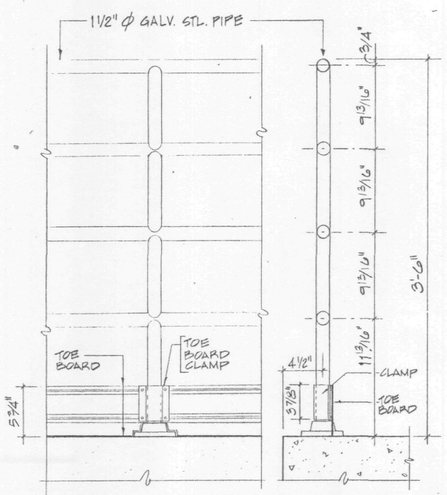
0 1 3 5

SCALE IN FEET

S1 — SECTION

0 1 3 5

SCALE IN FEET



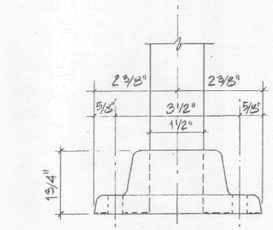
E2 — ELEVATION

S2 — SECTION

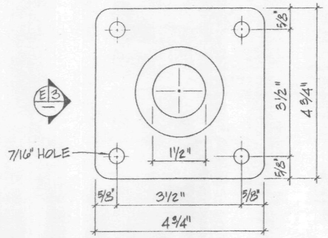
D2 — PIPE RAIL DETAIL

0 1 2 3

SCALE IN FEET



E3 — ELEVATION



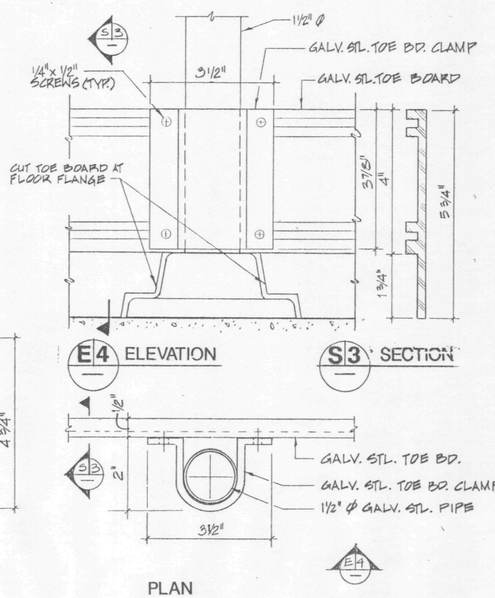
PLAN

(HEAVY DUTY)

D3 — FLOOR FLANGE DETAIL

0 1" 3" 6"

SCALE IN INCHES

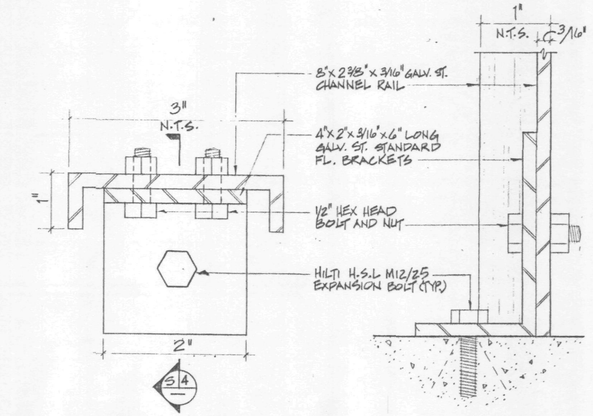


PLAN

D4 — TOE BOARD/CLAMP DETAIL

0 1" 3" 6"

SCALE IN INCHES



D5 — LADDER FLOOR ANCHORAGE DETAIL

0 1" 3"

SCALE IN INCHES

S4 — SECTION

0 1" 2"

SCALE IN INCHES

Sheet 36 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

for
CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
LADDER AND RAILING
SECTIONS, ELEVATIONS
AND DETAILS

CONFORMED
7/17/95

No. Date Revision Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

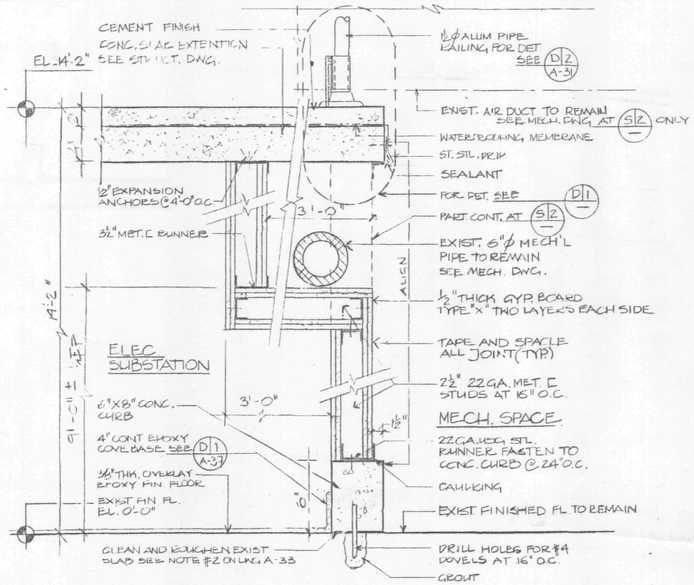
R.J.	R.J.	L.V.G.
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number Drawing Number

WTC-802.071 A-31

CHARRETTE

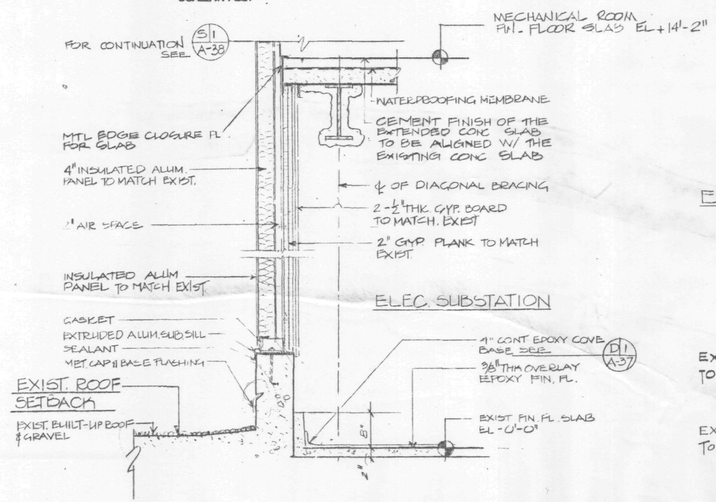


S|1 — SECTION THRU 2-HOUR RATED PARTITION WITH OFFSET

SCALE IN FEET

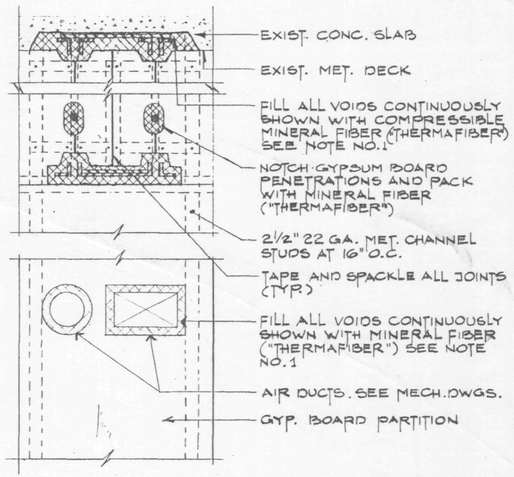
S|2 — SECTION THRU 2-HOUR RATED PARTITION WITH CONCRETE CURB (SIMILAR)

SCALE IN FEET



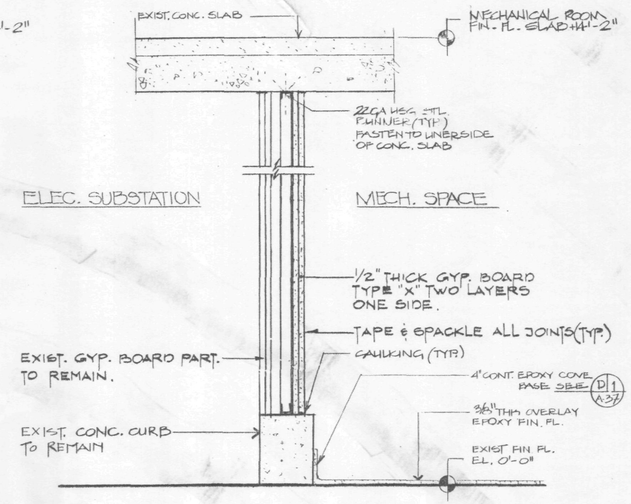
S|3 — EXTERIOR WALL SECTION @ SUB STATION OF 41ST FLOOR. 75TH FLOOR SIMILAR

SCALE IN FEET



S|4 — SECTION THRU FIRESTOPPING OF TYPICAL OPENING IN RATED WALL

N.T.S.

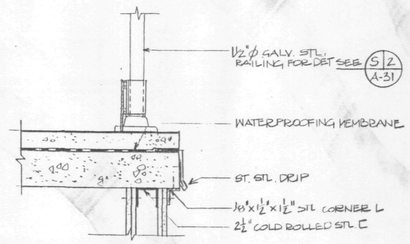


S|5 — UPGRADE 2-HOUR PARTITION

SCALE IN FEET

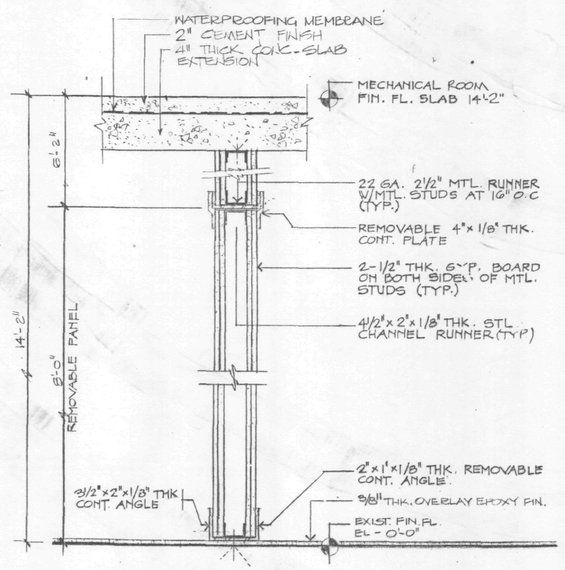
NOTES:

1. FILL ALL VOIDS OF PARTITION CONTINUOUSLY BETWEEN SLAB AND TOP RUNNER! PACK TIGHT WITH "THERMAFIBER" SAFING INSULATION AND SEAL WITH SMOKE STOP SEALANT.
2. BEFORE INSTALLING CHANNEL STUDS WRAP TOP AND BOTTOM OF STUDS WITH ELECTRICAL TAPE TO ISOLATE METAL FROM METAL.
3. DO NOT FASTEN STUD TO TOP CHANNEL RUNNERS. (IN ALL RATED WALLS DO NOT SECURE GYP. BOARD TO TOP CHANNEL RUNNER.)



D|1 — DETAIL THRU THE EDGE OF SLAB

SCALE IN FEET



S|6 — SECTION THRU REMOVABLE PANEL WALL

SCALE IN FEET

Sheet 37 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
WALL SECTIONS AND DETAIL

CONFORMED
7/17/95

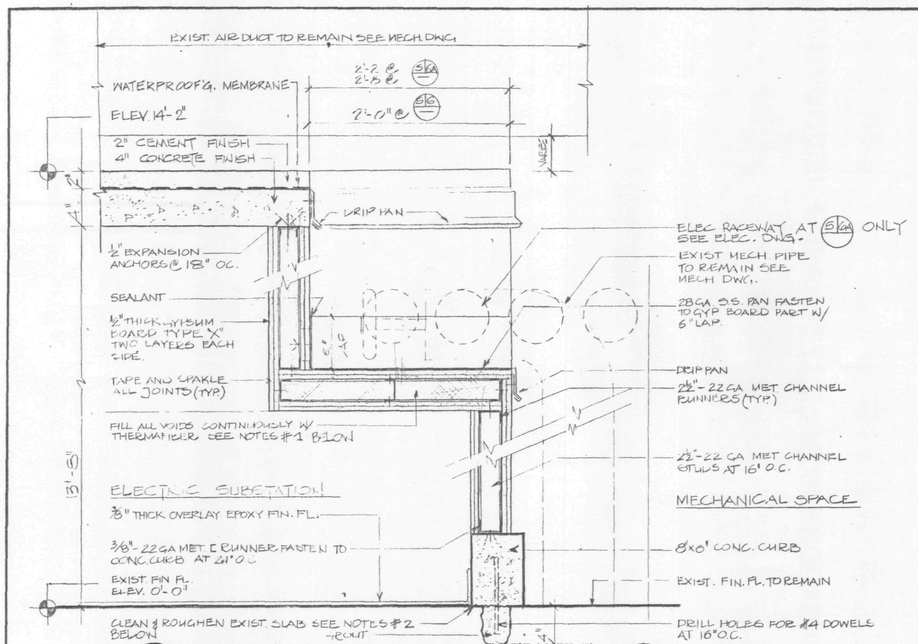
No.	Date	Revision	Approved

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V. GALAN, G.K. — G.K. — L.V. GALAN
Designed by — Drawn by — Task Leader
PRINCIPAL ARCHITECT
Date 5/1/95 — Scale AS NOTED

Contract Number
WTC-802.071

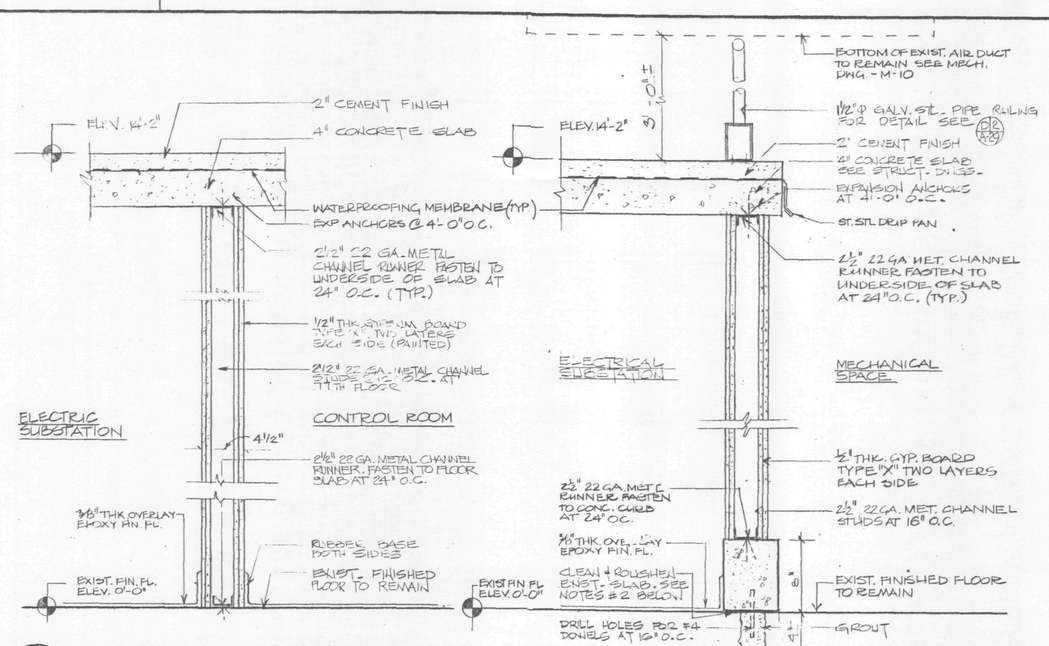
Drawing Number
A-32



S/6 — 2-HOUR PARTITION WITH OFFSET

SCALE IN FEET

S/6A — SIMILAR



S/7 — 2-HOUR RATED PARTITION

SCALE IN FEET

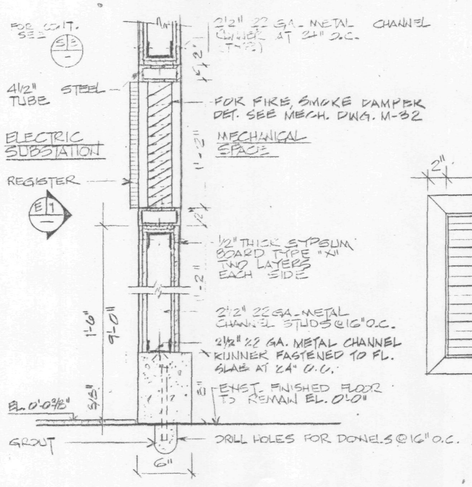
S/8 — 2-HOUR RATED PARTITION

SCALE IN FEET

NOTES:

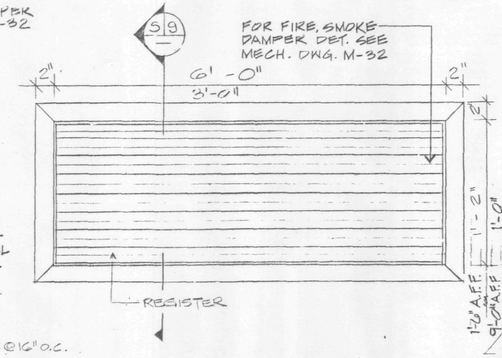
1- FILL ALL VOIDS CONTINUOUSLY WITH COMPRESSIBLE MINERAL FIBER (THERMAFIBER)

2- CLEAN AND ROUGHEN EXISTING CONCRETE SLAB AND APPLY COAT OF EPOXY BONDING CEMENT UNDER ALL NEW CURBS



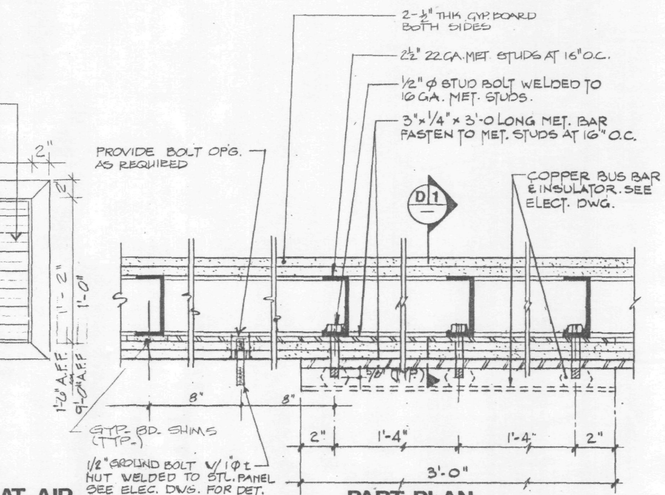
S/9 — WALL SECTION THRU AIR REGISTER

SCALE IN FEET



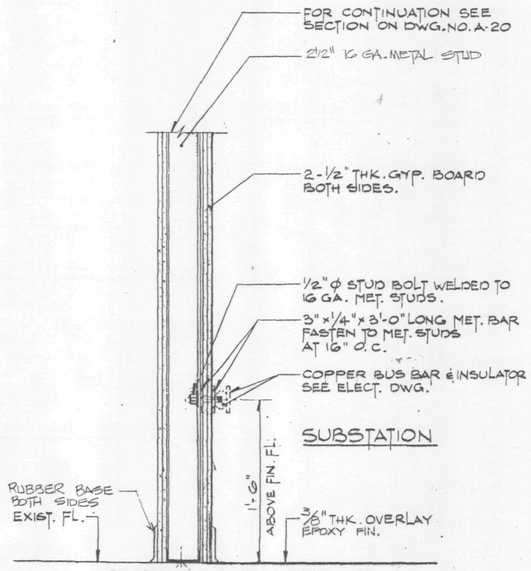
E/1 — FRONT ELEVATION AT AIR REGISTER WITH FIRE DAMPER

SCALE IN FEET



P/1 — PART PLAN (GROUND BUS SUPPORT)

SCALE IN FEET



D/1 — GROUND BUS SUPPORT BAR DETAIL (TYP.)

SCALE IN FEET

Sheet 38 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL

SECTIONS, ELEVATION, PLAN AND DETAIL

CONFORMED

7/17/95

No.	Date	Revision	Approved

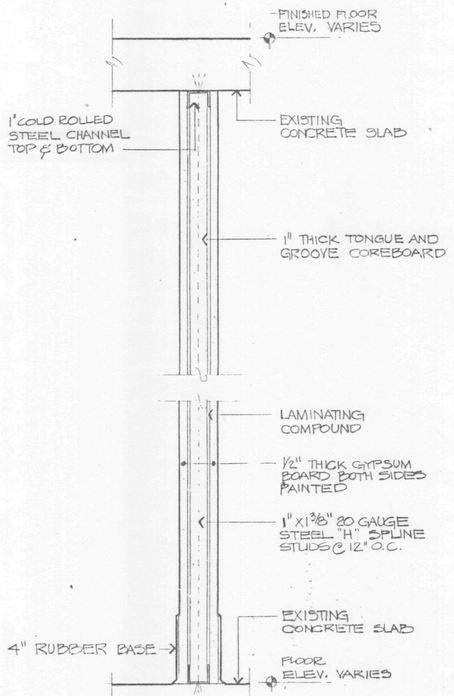
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V. GALAN, G.K.	G.K.	L.V. GALAN
Designed by	Drawn by	Task Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

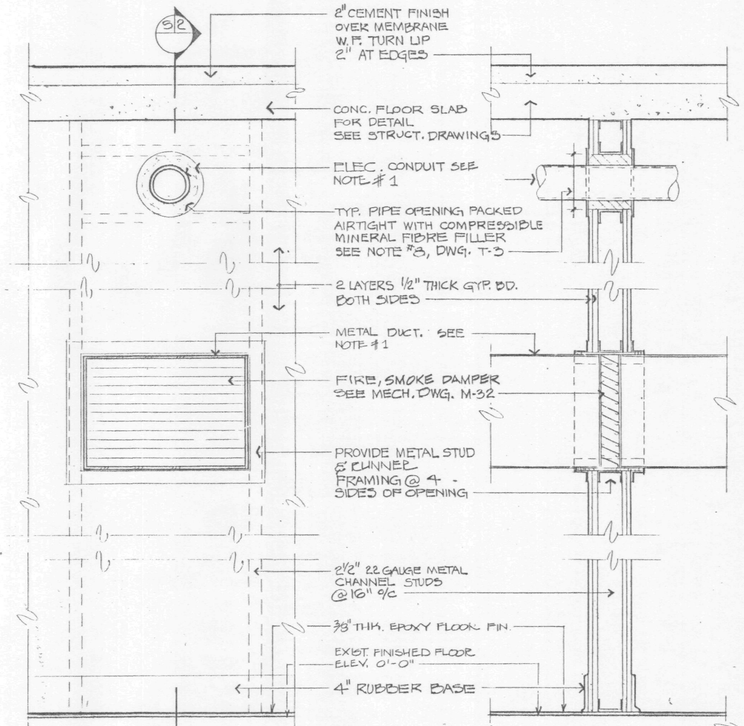
Contract Number WTC-802.071 Drawing Number A-33



2 HOUR RATED COREBOARD PARTITION

S 1

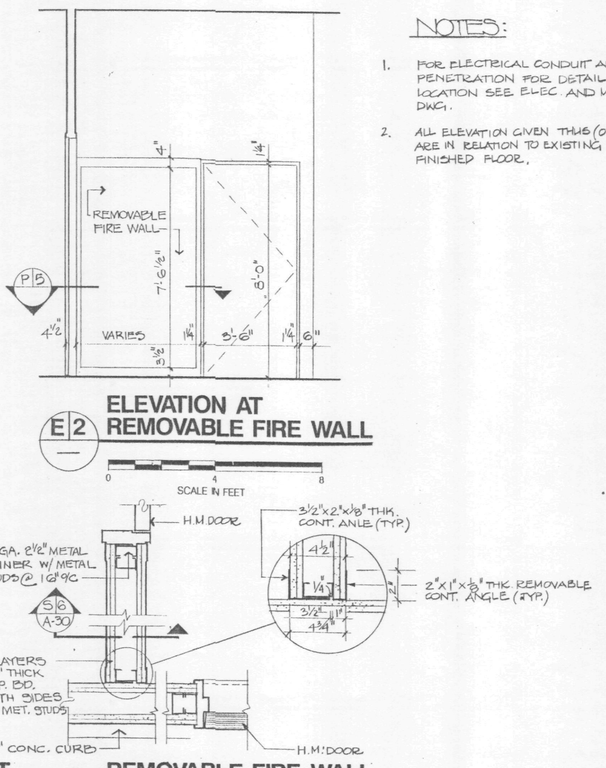
SCALE IN FEET 0 1/2 1



ELEVATION AT AIR DUCT

E 1

SCALE IN FEET 0 1 2



ELEVATION AT REMOVABLE FIRE WALL

E 2

SCALE IN FEET 0 4 8

SECTION THRU AIR DUCT AND ELECTRICAL CONDUIT

S 2

SCALE IN FEET 0 1 2

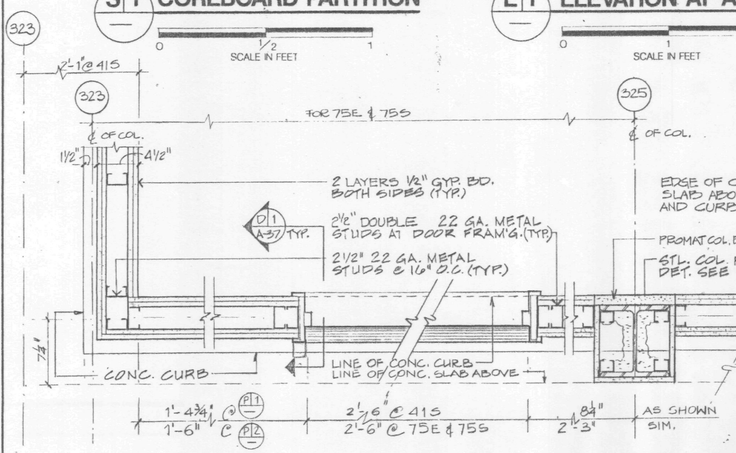
REMOVABLE FIRE WALL ENLARGED PART PLAN

P 5

SCALE IN FEET 0 1 2

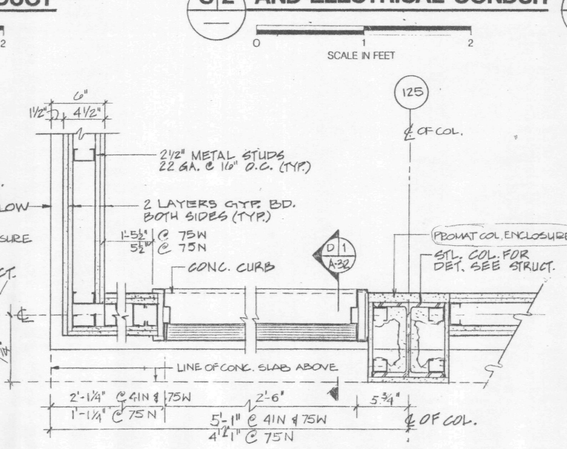
NOTES:

1. FOR ELECTRICAL CONDUIT AIR DUCT PENETRATION FOR DETAIL AND LOCATION SEE ELEC. AND MECH'L DWG.
2. ALL ELEVATION GIVEN THUS (0'-0") ARE IN RELATION TO EXISTING FINISHED FLOOR.



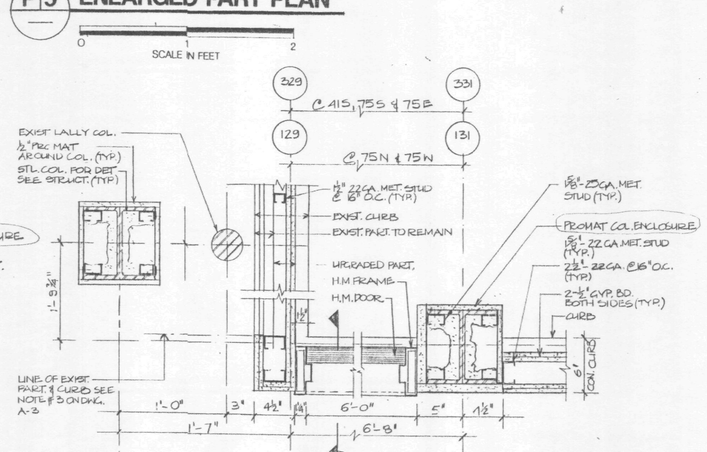
P 1 ENLARGED PART PLAN P 2 SIMILAR

SCALE IN FEET 0 1 2



P 3 ENLARGED PART PLAN

SCALE IN FEET 0 1 2



P 4 ENLARGED PART PLAN

SCALE IN FEET 0 1 2

Old Bluering Inc. #2581 Form 9232

Sheet 39 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

CONFORMED
7/17/95

No.	Date	Revision	Approved

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SECTIONS, ELEVATION AND PART PLANS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

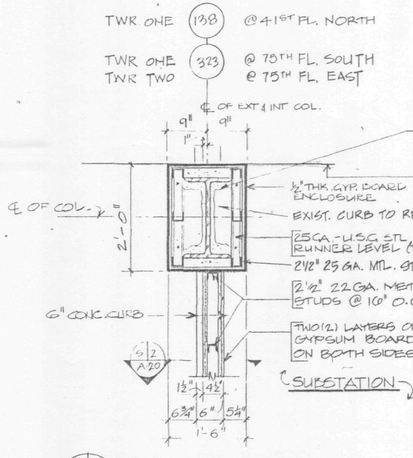
L.V.G.	R.J. A.T.S.	L.V.G.
Designed by	Drawn by	Mark Leader

PRINCIPAL ARCHITECT

Date 5/1/95 Scale AS NOTED

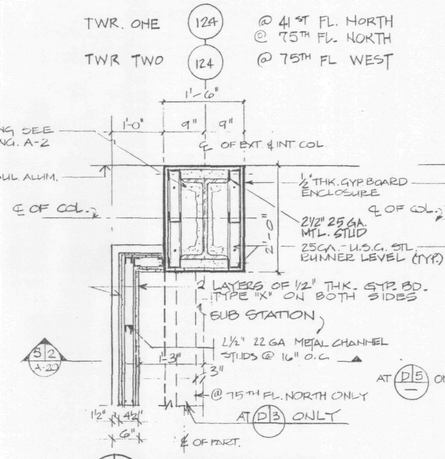
Contract Number WTC-802.071

Drawing Number A-34



D 1 — CORNER DETAIL

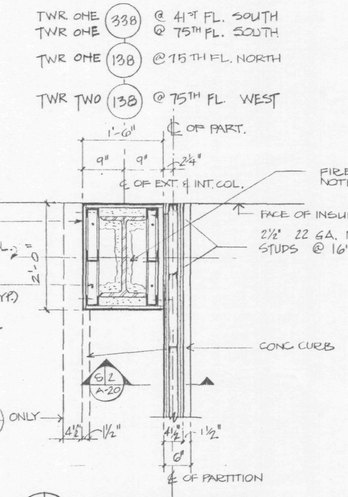
SCALE IN FEET 0 1 2 3



D 2 — CORNER DETAIL

SCALE IN FEET 0 1 2 3

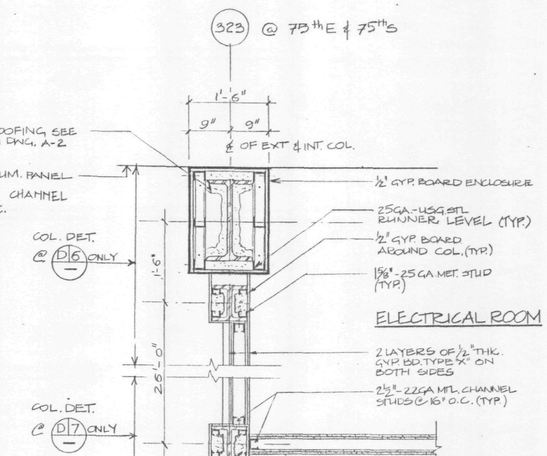
D 3 — DETAIL SIMILAR



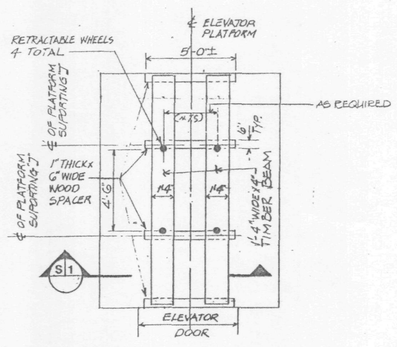
D 4 — CORNER DETAIL

SCALE IN FEET 0 1 2 3

D 5 — DETAIL SIMILAR

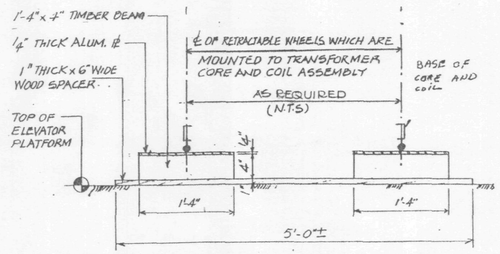


D 6 — CORNER DETAIL D 7 — SIMILAR



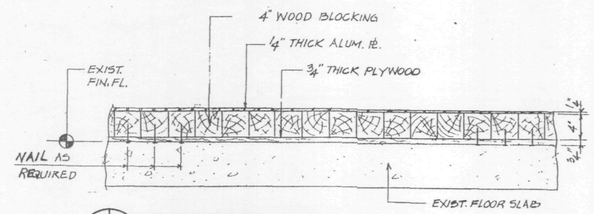
P 1 — PART PLAN

SCALE IN FEET 0 4 8



S 1 — CRIBBING DETAIL AT PLATFORM OF ELEVATORS NO. 6 AND 17

SCALE IN FEET 0 1 2



S 2 — CRIBBING DETAIL

SCALE IN FEET 0 1 2

NOTES:

1. FOR ROUTING AND CRIBBING NOTES, SEE DWG. NO. A-21.
2. FOR INFORMATION RELATING TO LOCATION AND ARRANGEMENT OF TRANSFORMERS, TRANSFORMER BABES AND ALL OTHER ELECTRICAL EQUIPMENT AT SUBSTATION ROOM, SEE ELECTRICAL DRAWINGS.
3. FOR CRIBBING AT ALL ROUTING AREA SHOWN SHADED ON PLAN SEE DETAIL ON THIS DWG.

Sheet 40 of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
MISCELLANEOUS DETAILS

CONFORMED
7/17/95
No. Date Revision Approved

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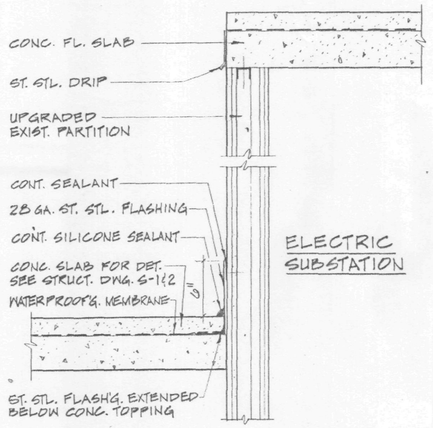
L.V.G. D.D. L.V.G.
Designed by Drawn by Task Leader
PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

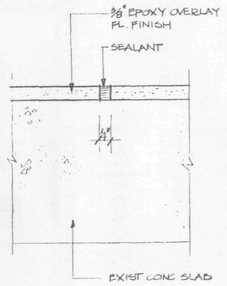
Contract Number WTC-802.071
Drawing Number A-35

CHARRETTE



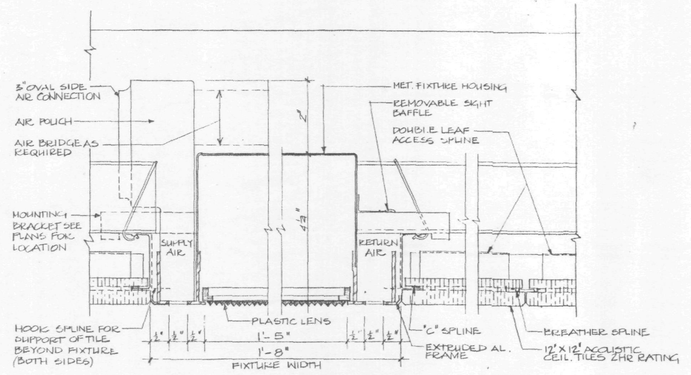
D 1 / A-39 **FLASHING DETAIL**

0 1 2
SCALE IN FEET



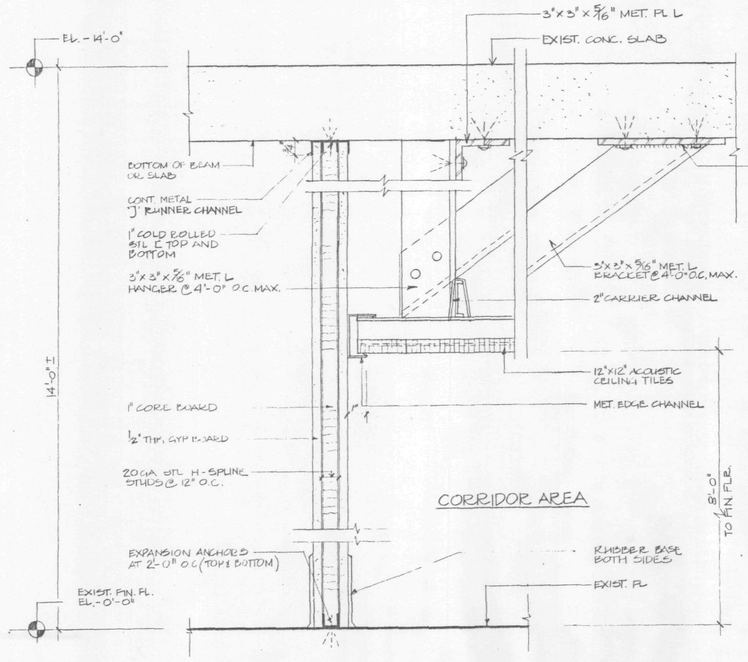
D 2 **CONTROL JOINT DETAIL**

0 2 4
SCALE IN INCHES



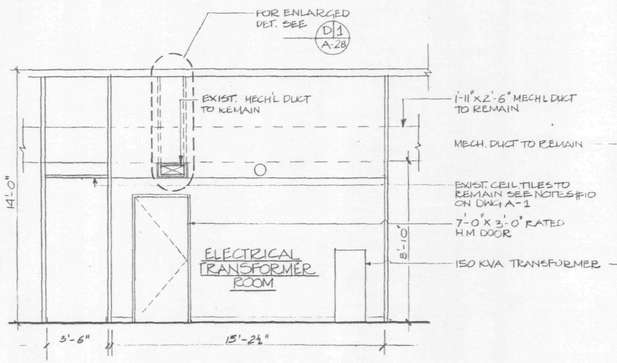
D 3 **LIGHT FIXTURE DETAIL**

0 2 4
SCALE IN INCHES



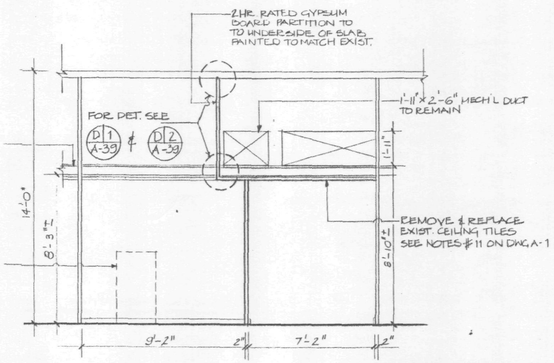
S 1 **CORE PARTITION**

0 1/2 1
SCALE IN FEET



S A **SECT. THRU TRANSFORMER ROOM**

0 4 8
SCALE IN FEET



S B **SECT. THRU TRANSFORMER ROOM**

0 4 8
SCALE IN FEET

FILE NAME: FILNAME SCALE FACTOR: SCALE

Sheet 41 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

Title

TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
SECTIONS AND DETAILS

CONFORMED
7/17/95

No.	Date	Revision	Approved

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Designed by	Drawn by	Task Leader
A.T.SOLAWA	A.T.S.	L.V.GALAN

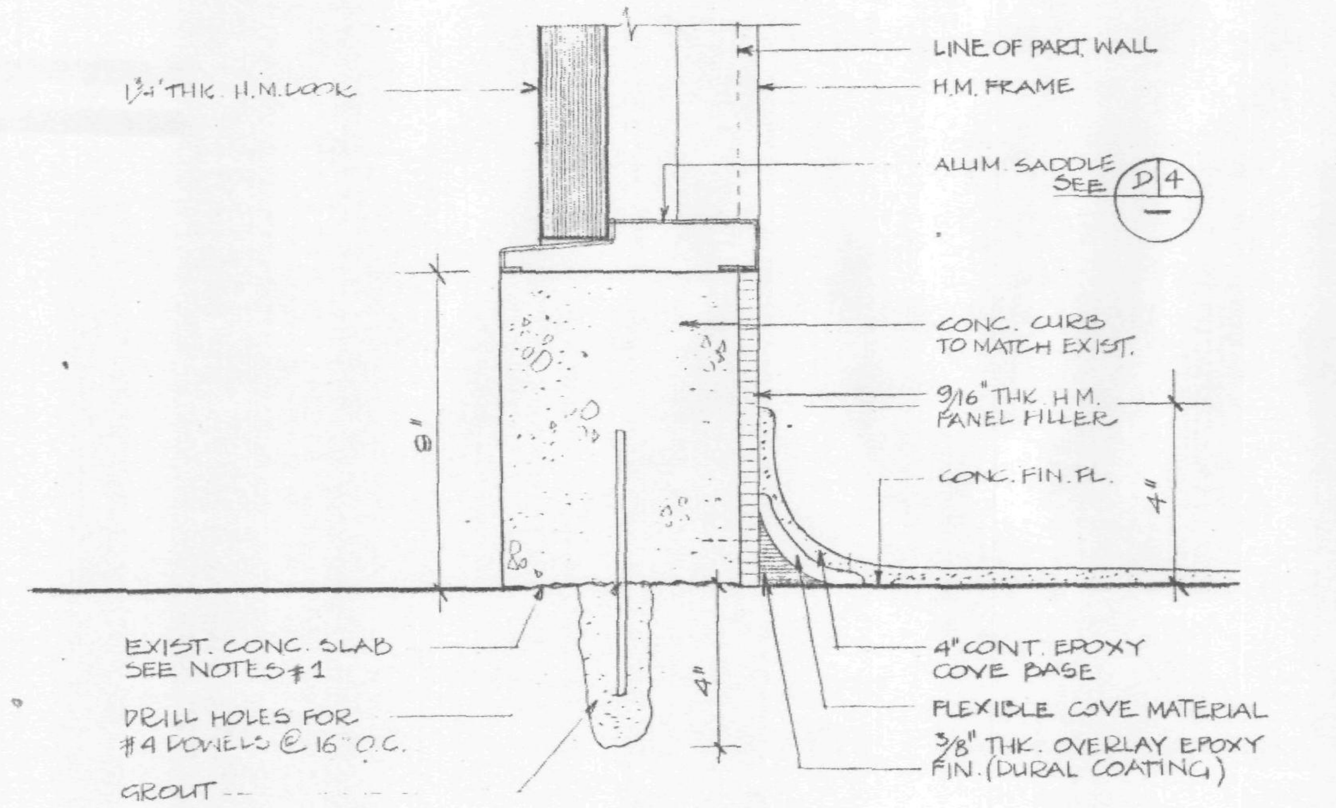
Principal Architect

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-36

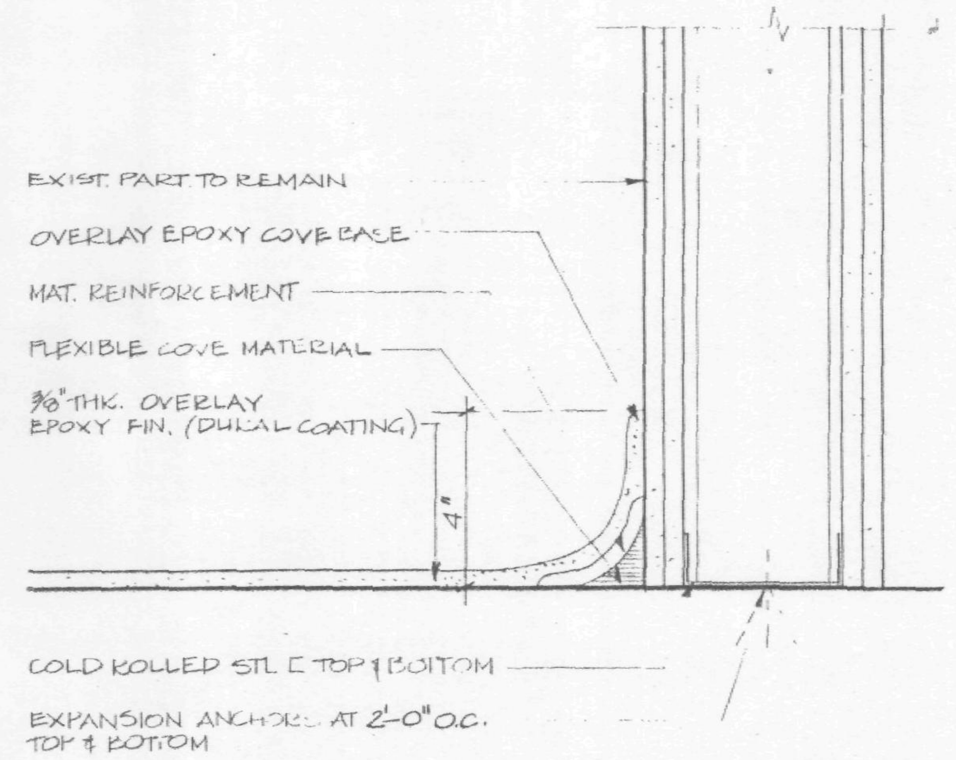
NOTES:

1. CLEAN AND ROUGHEN EXISTING CONCRETE SLAB AND APPLY COAT OF EPOXY BONDING CEMENT UNDER ALL THE NEW CONCRETE CURBS
2. FOR ALL FIREPROOFING REQUIREMENT SEE NOTES ON DWG. A-2.



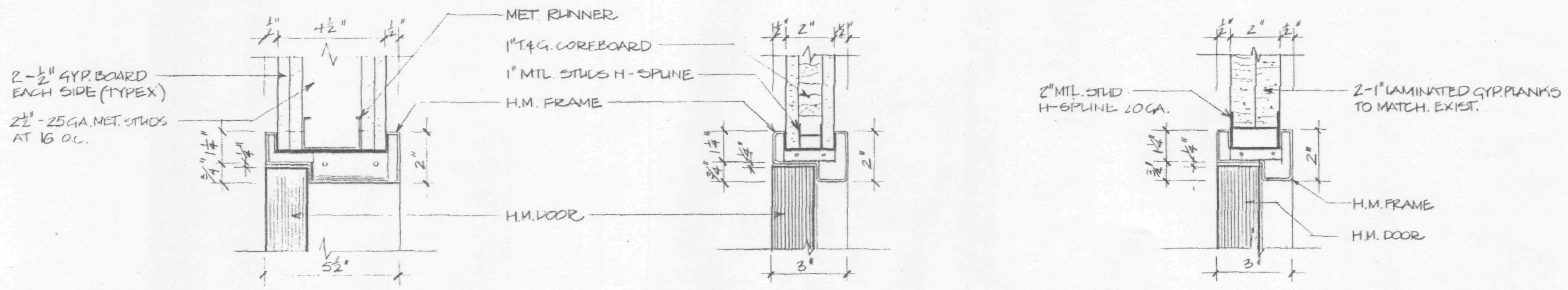
D1 CONC. CURB DETAIL AT DOOR (TYP.)

SCALE IN INCHES



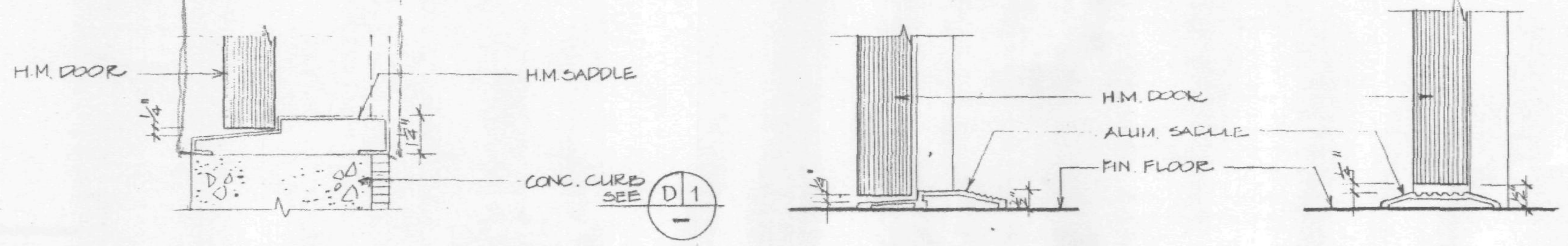
D2 COVE BASE DETAIL (TYP.)

SCALE IN INCHES



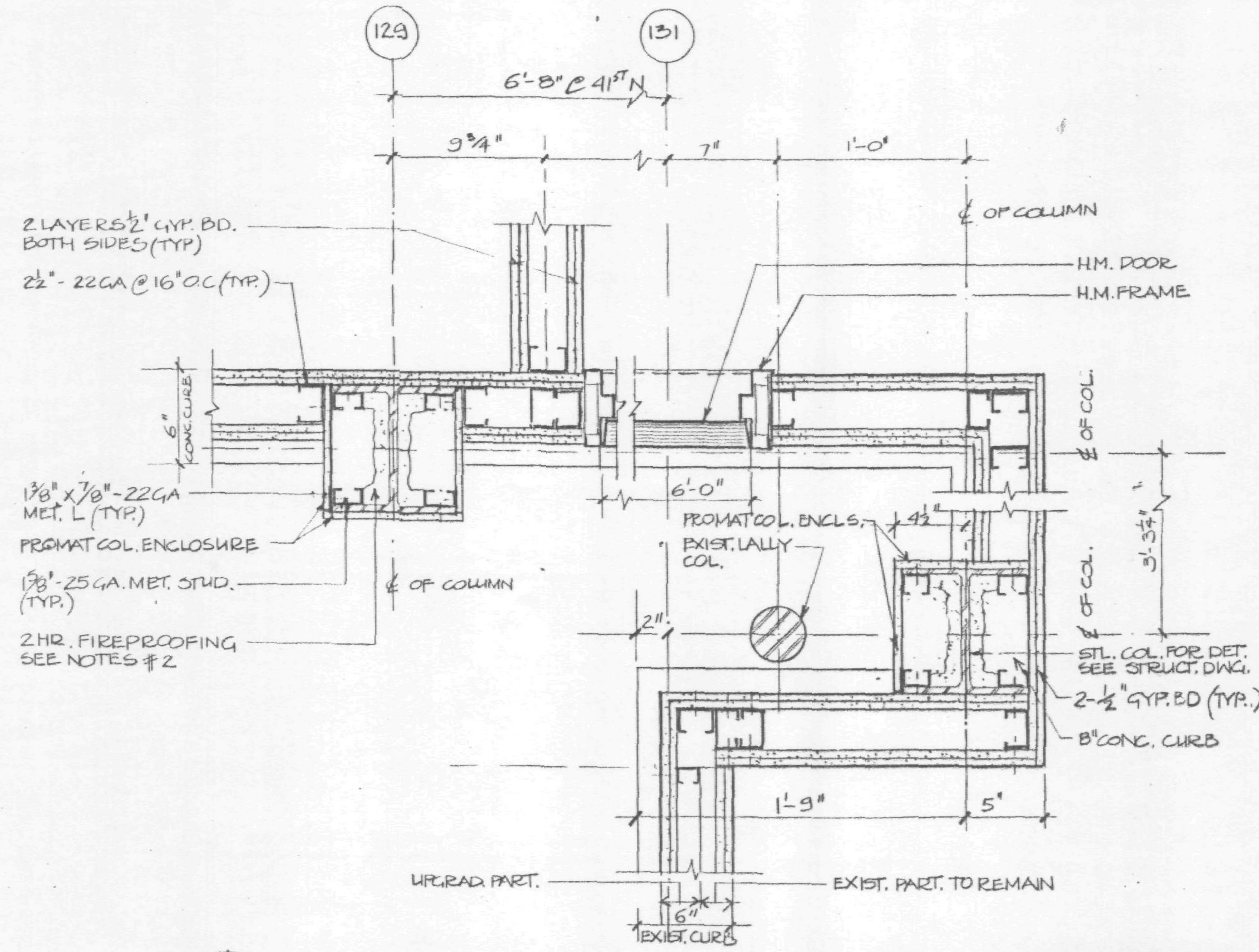
D3 DOOR HEAD TYPES

SCALE IN FEET



D4 TRESHOLD TYPES

SCALE IN FEET



P1 ENLARGED PART PLAN AT 41N FLOOR ONLY

SCALE IN FEET

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center

Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO
LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
MISCELLANEOUS DETAILS

CONFORMED
7/17/95

No. Date Revision Approved

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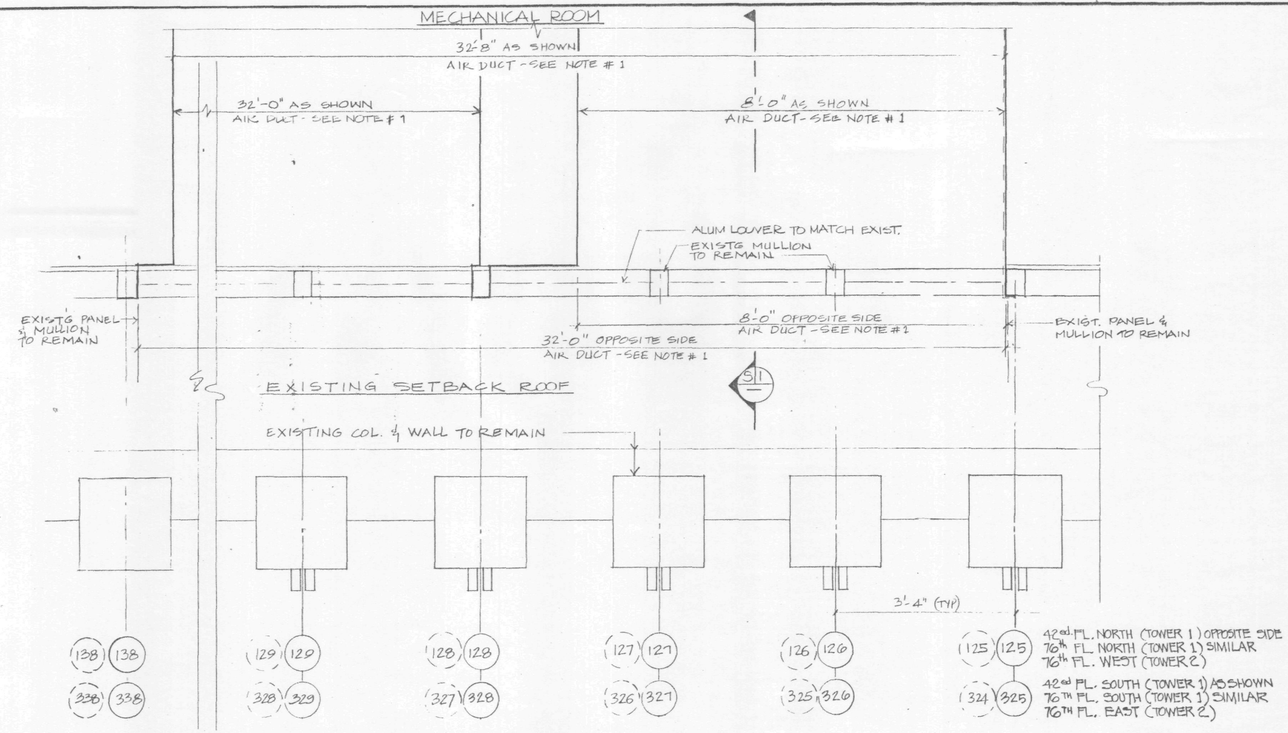
A.T.SOLAWA	A.T.S.	L.V.GALAN
Designed by	Drawn by	Task Leader

Principal Architect

Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071 Drawing Number A-37



P 1 — PART PLAN OF EXTERIOR WALL AT SUB STATION OF 42 nd FLOOR. (TYPICAL)

0 1 2 3
SCALE IN FEET

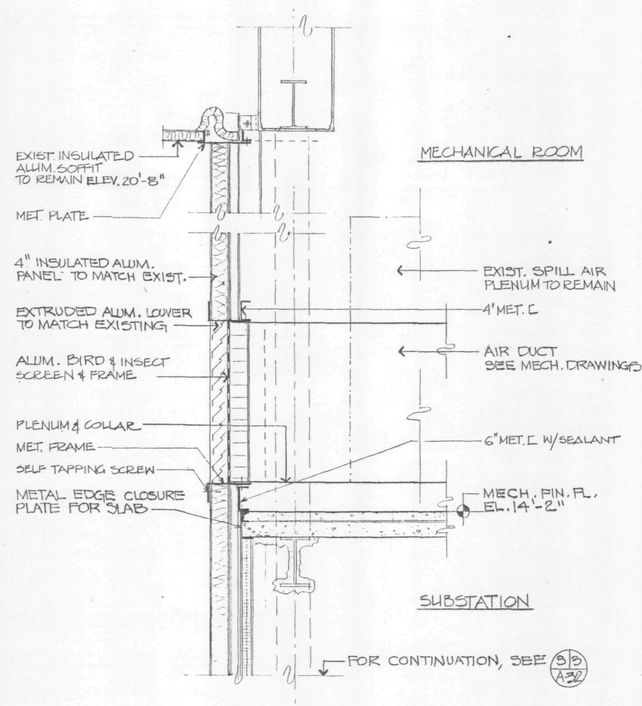
P 2 — 76TH FLOOR (SIMILAR) AT TOWERS ONE AND TWO

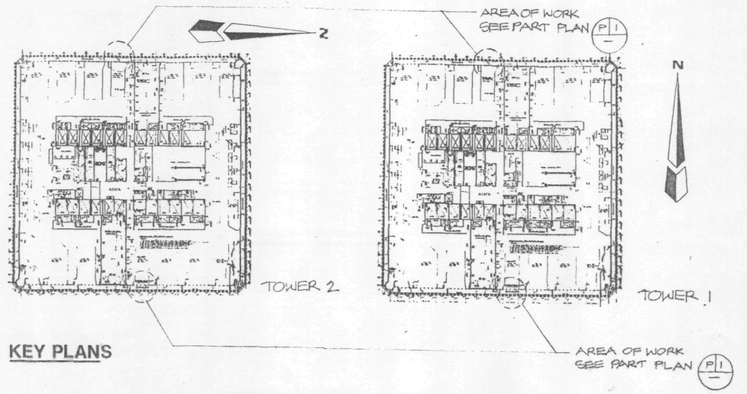
S 1 — SECTION THRU MECHANICAL LOUVERS

0 1 2 3
SCALE IN FEET

NOTES:

1. FOR AIR DUCT DETAIL AND PENETRATION LOCATION SEE MECHANICAL DWG'S: M-8, M-12, M-17, M-21, M-25 AND M-29





KEY PLANS

Sheet 43 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K. Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title
TOWERS ONE AND TWO LOW VOLTAGE SUBSTATIONS CONSTRUCTION AND INSTALLATION

ARCHITECTURAL
AIR DUCT PENETRATION PLAN

CONFORMED
7/17/95

No. Date Revision Approved

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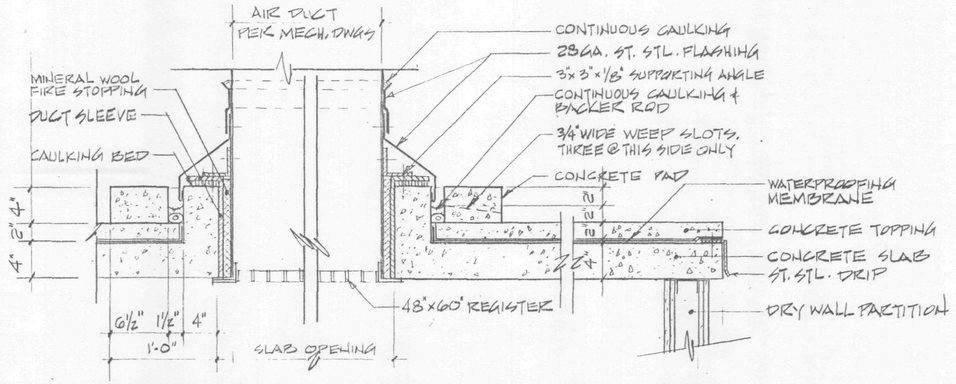
A.T.S. L.V.G. D.D. A.T.S. L.V.G.

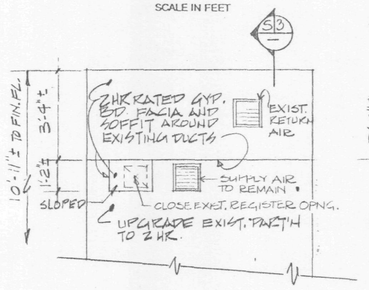
Designed by Drawn by Task Leader
PRINCIPAL ARCHITECT
Date 5/1/95 Scale AS NOTED

Contract Number WTC-802.071
Drawing Number A-38



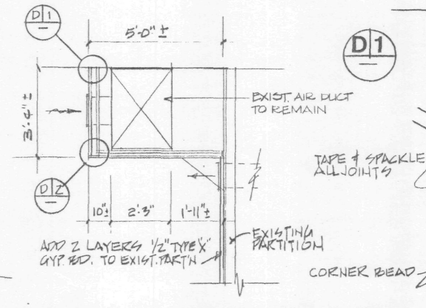
S1 SECTION THRU SLAB PENETRATION — S2 SIMILAR

SCALE IN FEET 0 1 2



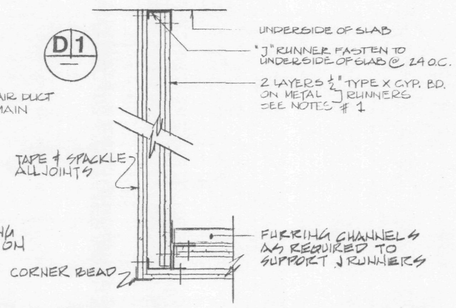
E2 PARTIAL ELEVATION

SCALE IN FEET 0 3 6



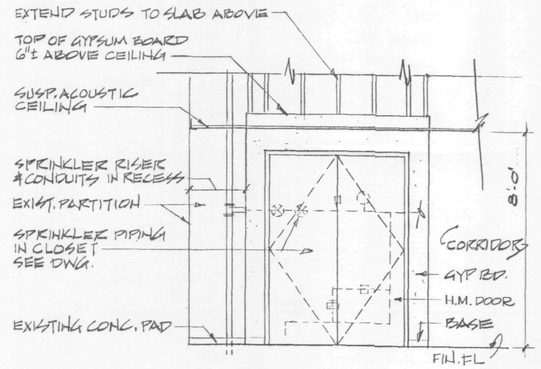
S3 SECTION THRU SOFFIT

SCALE IN FEET 0 3 6



D2 DETAILS OF DUCT ENCLOSURE

SCALE IN FEET 0 1 2

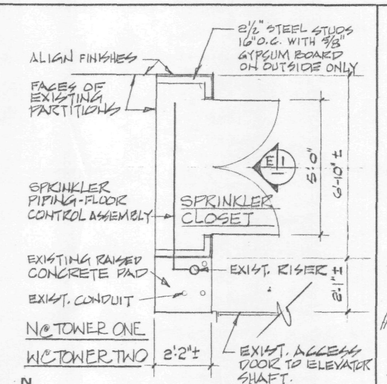


E1 ELEVATION

SCALE IN FEET 0 3 6

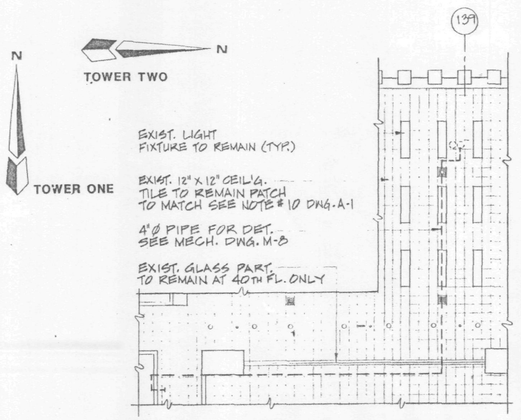
NOTES:

1. "J" STUDS OR EQUIVALENT SYSTEM TO PROVIDE CONTINUOUS 2HRS. FIRE RATED ENCLOSURE AROUND DUCTS.
2. REMOVE & REPLACE EXIST. CEILING TO MATCH EXISTING.



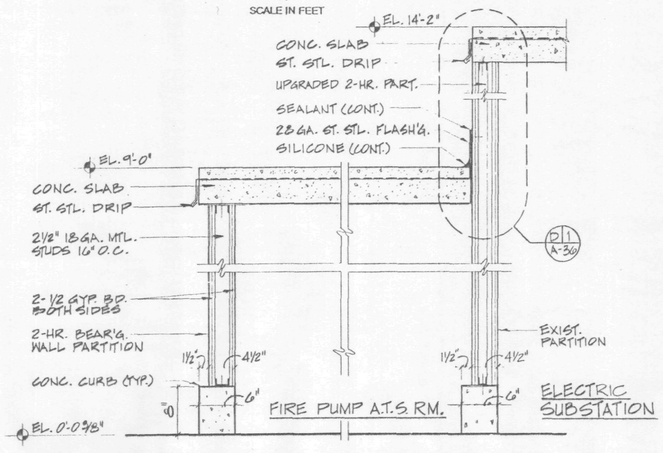
P1 ENLARGED PLAN OF SPRINKLER CLOSET

SCALE IN FEET 0 3 6



P2 PART REFLECTED CEILING PLAN AT 40th FL. TOWER ONE (TYPICAL) 74th FL. TOWER TWO SIMILAR

SCALE IN FEET 0 8 16



S4 SECTION THRU 2-HOUR BEARING WALL AND EXIST. 2-HOUR UPGRADED PARTITION

SCALE IN FEET 0 1 2

Sheet 44 Of 224

THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
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Designed by	Drawn by	Task Leader
L.V.GALAN R.JOYNER	D.R.	L.V.GALAN
Principal Architect		
Date 5/1/95	Scale	AS NOTED

Contract Number WTC-802.071

Drawing Number A-39

DOOR SCHEDULE

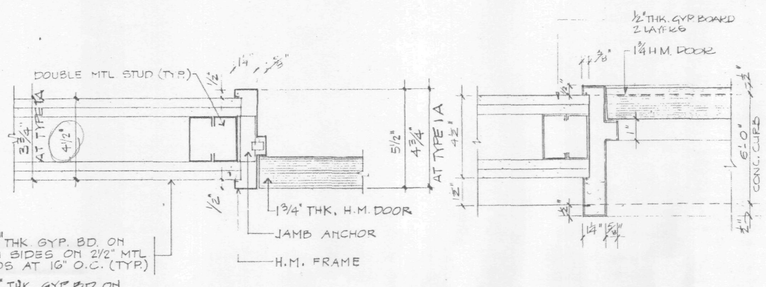
LOCATION		DOORS							BUCKS		HARDWARE SET NO.	SADDLE TYPE *	REMARKS
TOWER	FLOOR	NO.	TYPE	MATERIAL	JAMB W	OPNG H	THK.	FIRE LABEL	TYPE	MAT.			
ONE	41 N	1	A	H.M.	2'-6"	8'-0"	1¾"	B	2 (1)	H.M.	2	I	LOWERED DOOR W/FSD
ONE	41 N	2	B	H.M.	3'-0"	8'-0"	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
ONE	41 N	3	C	H.M.	6'-0"	9'-0"	1¾	B	2 (1)	H.M.	6	I	DOUBLE DOORS
ONE	41 N	4	A	H.M.	3'-0"	8'-0"	1¾	B	2	H.M	2	I	
ONE	42 N	5	C	H.M.	6'-0"	7'-0"	1¾	B	4	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
ONE	41 S	6	A	H.M.	2'-6"	8'-0"	1¾		2	H.M.	2	I	LOUVER DOOR W/FSD
ONE	41 S	7	B	H.M.	3'-0"	8'-0"	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
ONE	41 S	8	C	H.M.	6'-0"	9'-0"	1¾	B	2	H.M.	6	I	DOUBLE DOORS
ONE	41 S	9	A	H.M.	3'-0"	8'-0"	1¾		2	H.M.	2	I	
ONE	41 S	10	D	H.M.	3'-0"	8'-0"	1¾"		3	H.M.	(4)	N/A	UPGRADE PARTITION
ONE	41 S	11	A	H.M.	3'-0"	8'-0"	1¾"	B	3	H.M.	3	III	UPGRADE PARTITION
ONE	41 S	(12)	D	H.M.	3'-0"	8'-0"	1¾"		3 ✓	H.M.	3	III	
ONE	41 S	(13)	D	H.M.	3'-0"	8'-0"	1¾"		3 ✓	H.M.	3	III	
ONE	41 S	(14)	A	H.M.	3'-0"	8'-0"	1¾"	B	3	H.M.	1	II	STAIR EXIT
ONE	41 S	(15)	D	H.M.	3'-0"	8'-0"	1¾"		3	H.M.	3	III	
ONE	42 S	16	C	H.M.	6'-0"	7'-0"	1¾"	B	3	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
ONE	75 N	17	A	H.M.	2'-6"	8'-0"	1¾	B	2	H.M.	2	I	LOUVER DOOR W/FSD
ONE	75 N	18	D	H.M.	3'-0"	8'-0"	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
ONE	75 N	19	C	H.M.	6'-0"	9'-0"	1¾	B	2	H.M.	6	I	DOUBLE DOORS
ONE	76 N	20	A	H.M.	3'-0"	8'-0"	1¾	B	2	H.M.	2	I	
ONE	76 N	21	C	H.M.	6'-0"	7'-0"	1¾	B	3	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
ONE	76 N	22	A	H.M.	3'-0"	8'-0"	1¾	B	3	H.M.	1	II	STAIR EXIT
ONE	75 S	23	A	H.M.	2'-6"	8'-0	1¾	B	2	H.M.	2	I	LOUVER DOOR W/FSD
ONE	75 S	24	D	H.M.	3'-0"	8'-0	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
ONE	75 S	25	A	H.M.	3'-0"	8'-0	1¾	B	2	H.M.	2	I	
ONE	75 S	26	C	H.M.	6'-0"	9'-0"	1¾	B	2	H.M.	6	I	DOUBLE DOORS
ONE	75 S	27	D	H.M.	3'-0"	8'-0"	1¾		3	H.M.	2	III	
ONE	76 S	28	C	H.M.	6'-0"	8'-0	1¾	B	3	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
ONE	76 S	29	A	H.M.	3'-0"	8'-0	1¾	B	3	H.M.	1	II	STAIR EXIT
TWO	75E	30	A	H.M.	2'-6"	8'-0"	1¾	B	2	H.M.	2	I	LOUVER DOOR W/FSD
TWO	75E	31	D	H.M.	3'-0"	8'-0"	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
TWO	75E	32	C	H.M.	6'-0"	9'-0"	1¾	B	2	H.M.	6	I	DOUBLE DOORS/CARD ACCESS
TWO	75E	33	A	H.M.	3'-0"	7'-0"	1¾	B	2	H.M.	2	I	
TWO	75E	34	D	H.M.	3'-0"	7'-0"	1¾		3	H.M.	2	III	
TWO	76E	35	A	H.M.	3'-0"	8'-0"	1¾	B	3	H.M.	1	II	STAIR EXIST
TWO	76E	36	C	H.M.	6'-0"	8'-0"	1¾	B	3 (1)	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
TWO	75W	37	A	H.M.	2'-6"	7'-0"	1¾		2	H.M.	2	I	LOUVER DOOR W/FSD
TWO	75W	38	B	H.M.	3'-0"	7'-0"	1¾		1	H.M.	4	N/A	LOUVER DOOR W/FSD
TWO	75W	39	C	H.M.	6'-0"	9'-0	1¾	B	2	H.M.	6	I	DOUBLE DOORS
TWO	75W	40	A	H.M.	3'-0"	7'-0"	1¾	B	2	H.M.	2	I	
TWO	76W	41	C	H.M.	6'-0"	8'-0"	1¾	B	3 (1)	H.M.	5	III	DOUBLE DOORS/CARD ACCESS
TWO	76W	42	A	H.M.	3'-0"	8'-0"	1¾	B	3	H.M.	1	II	STAIR EXIST
ONE	76S	43	A	H.M.	5'-0"	7'-0"	1¾		1A	H.M	7	N/A	DOUBLE DOORS
TWO	76E	44	A	H.M.	5'-0"	7'-0"	1¾		1A	H.M	7	N/A	DOUBLE DOORS

* FOR SADDLE TYPE DETAIL AND LOCATION SEE DWG. A-37

FINISH SCHEDULE

LOCATION				FLOOR FINISH	BASE MATERIAL	WALLS		CEILING		REMARKS
TOWER	FLOOR	NO.	SPACE			MATERIAL	FINISH	MATERIAL	FINISH	
ONE	41 NO.	100	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	GYP. BD.	PAINTED	—	—	
ONE	41 NO.	101	ELEV. A.T.S. ROOM	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	41 NO.	102	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	41 NO.	103	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	41 NO.	104	EXIST. CORRIDOR	CONC. SLAB	*	GYP. BD.	PAINTED	—	—	RUBBER BASE AS REQ.
ONE	42 NO.	105	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	ALUM. RAILING
ONE	42 NO.	106	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	—	—	
ONE	41 SO.	107	ELEV. A.T.S. ROOM	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	41 SO.	108	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	41 SO.	109	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	41 SO.	110	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	41 SO.	111	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	"	"	—	—	
ONE	41 SO.	112	EMERGENCY TRANSFORMER	MTD. CONC. SLAB	"	"	"	—	—	
ONE	41 SO.	113	MECH. LOCKER ROOM	MTD. CONC. SLAB	"	GYP. BD.	PAINTED	—	—	
ONE	42 SO.	114	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	"	"	—	—	
ONE	42 SO.	115	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	ALUM. RAILING
ONE	75 NO.	116	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	75 NO.	117	ELEC. A.T.S. ROOM	EPOXY	"	"	"	—	—	
ONE	75 NO.	118	MECH. SPACE	MTD. CONC. SLAB	—	GYP. BD.	PAINTED	—	—	
ONE	75 NO.	119	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	75 NO.	120	EXIST. CORRIDOR	CONC. SLAB	*	GYP. BD.	PAINTED	—	—	RUBBER BASE AS REQ.
ONE	76 NO.	121	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	ALUM. RAILING
ONE	76 NO.	122	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	—	—	
ONE	75 SO.	123	ELEV. A.T.S. ROOM	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	75 SO.	124	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
ONE	75 SO.	125	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	75 SO.	126	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
ONE	75 SO.	127	EXIST. CORRIDOR	CONC. SLAB	*	"	PAINTED	—	—	RUBBER BASE AS REQ.
ONE	75 SO.	128	ELEC. TRANSFORMER ROOM	MTD. CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	—	—	
ONE	76 SO.	129	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	ALUM. RAILING
ONE	76 SO.	130	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	—	—	
TWO	75 EA.	131	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
TWO	75 EA.	132	ELEV. A.T.S. ROOM	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
TWO	75 EA.	133	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
TWO	75 EA.	134	MECH. SPACE	MTD. CONC. SLAB	—	"	"	—	—	
TWO	75 EA.	135	EXIST. CORRIDOR	CONC. SLAB	*	"	"	—	—	RUBBER BASE AS REQ.
TWO	76 EA	136	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	ALUM. RAILING
TWO	76 EA.	137	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	ACOUSTIC CEILING	—	
TWO	75 WE.	138	ELEC. SUBSTATION	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
TWO	75 NE.	139	ELEV. A.T.S. ROOM	EPOXY	EPOXY/RUBBER BASE	"	"	—	—	
TWO	75 WE.	140	MECH. SPACE	MTD. CONC. SLAB	RUBBER BASE	"	"	—	—	
TWO	75 WE.	141	MECH. SPACE	MTD. CONC. SLAB	"	"	"	—	—	
TWO	75 NE.	142	EXIST. CORRIDOR	CONC. SLAB	*	GYP. BD.	"	—	—	RUBBER BASE AS REQ.
TWO	76 NE.	143	MECH. ROOM	MTD. CONC. SLAB	—	—	—	—	—	
TWO	76 WE.	144	EXIST. CORRIDOR	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	ACOUSTIC CEILING	—	
ONE	41 S.	108a	ELEC. PUMP ROOM	CONC. SLAB	RUBBER BASE	GYP. BD.	PAINTED	—	—	

* WHERE CONCRETE CURB EXIST NO RUBBER BASE IS REQUIRED

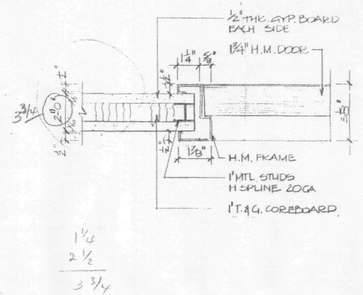


D1 JAMB TYPE 1

SCALE IN FEET 0 1/2 1

D2 JAMB TYPE 2

SCALE IN FEET 0 1/2 1



D3 JAMB TYPE 3

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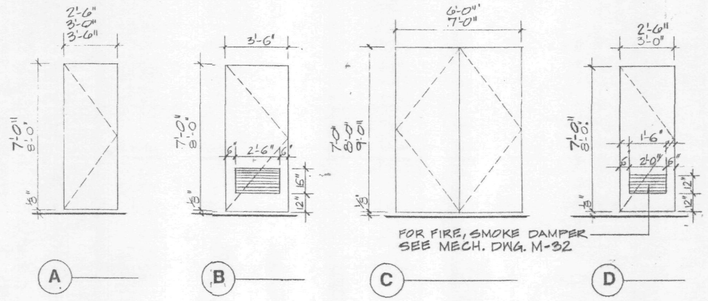

D4 DOOR TYPE

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THE PORT AUTHORITY OF NY & NJ

Peter K Sweeney
ENGINEERING PROGRAM MANAGER
WORLD TRADE CENTER

CHIEF ARCHITECT

Engineering Department
Design Division

The World Trade Center Electrical/HVAC Upgrade Program

Title

TOWER ONE AND TWO
LOW VOLTAGE SUBSTATIONS
CONSTRUCTION AND
INSTALLATION

ARCHITECTURAL
DOOR SCHEDULE
AND FINISH SCHEDULE

CONFORMED

No.	Date	Revision	Approved
	7/17/95		

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

L.V.G.	R.J. A.T.S.	L.V.G.
Designed by	Drawn by	Task Leader
PRINCIPAL ARCHITECT		
Date : 5/1/95		Scale AS NOTED

Contract Number WTC-802.071

Drawing Number A-40

CHARRETTE

REVISION No. 9

THE PORT AUTHORITY OF NY & NJ

WORLD TRADE CENTER

ADDITIONAL SUBSTATION SS-108A, ON THE 108TH FLOOR AT ONE WTC

CONTRACT No. WTC-810.041

ENGINEERING PROGRAM MANAGER .....

MANAGER CAPITAL PROGRAMS .....

CHIEF ENGINEER .....

FILE NAME: Z:\CW2-111.222\Den's_Jobs\108 Sub Station\WTC-810 041 G-1.dwg plotted on 12/3/1998 by DAVENOSO

REVISION No. 9

GENERAL NOTES

1. ALL WORK SHALL CONFORM AND COMPLY WITH NYC BUILDING CODE 27-348.
2. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS IN THE FIELD. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
3. THE CONTRACTOR SHALL NOT DRILL HOLES INTO EXISTING SLABS OR STRUCTURAL MEMBERS FOR THE PURPOSE OF SUPPORTING ANY LOADS, UNLESS WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER.
4. THE CONTRACTOR SHALL PROTECT WITH DUSTPROOF PARTITIONS THE PUBLIC OR TENANT SPACE BELOW FROM ANY DAMAGE RESULTING FROM FLOOR DRILLING OPERATIONS.
5. THE SPACE AROUND PIPES, DUCTS, ETC., PENETRATING FLOOR AND WALLS, SHALL NOT EXCEED 1/2" AND SHALL BE PACKED SOLID WITH MINERAL WOOL OR APPROVED EQUAL, AND BE CLOSED OFF BY CLOSE FITTING METAL ESCUTCHEONS ON BOTH SIDES OF THE PARTITION AS REQUIRED BY NYC BUILDING CODE 27-343.
6. FIRE STOPPING SHALL BE AS REQUIRED BY NYC BUILDING CODE 27-345.
7. MATERIALS INDICATED TO BE SALVAGED SHALL BE DELIVERED TO THE MATERIAL STORAGE AREA AS DIRECTED BY THE ENGINEER.
8. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN DRILLING THROUGH THE EXISTING CONCRETE SLAB, SO AS NOT TO DAMAGE THE RE-BAR REINFORCEMENT.
9. REFERENCE TOWER "A" IS ALSO ' 1 WTC '.
10. ASBESTOS FIREPROOFING ON STRUCTURAL MEMBERS IS LOCATED THROUGHOUT THE SITE. NO CONSTRUCTION WORK SHALL BE INITIATED PRIOR TO THE ABATEMENT OF ASBESTOS FIREPROOFING FROM AREAS IMPACTED BY THE INSTALLATION OF CONDUIT AND DUCTWORK. ASBESTOS ABATEMENT WILL BE PERFORMED BY OTHERS.
11. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES AND PRECAUTIONS TO PROTECT BOTH THE NEW AND EXISTING EQUIPMENT DURING THE REQUIRED CONSTRUCTION. THE CONTRACTOR SHALL CLEAN ALL EQUIPMENT TO THE SATISFACTION OF THE ENGINEER PRIOR TO BEING PLACED ON-LINE AND/OR TURNED OVER TO THE FACILITY.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE INSTALLATION, TESTING, AND FINAL ACCEPTANCE OF ALL EQUIPMENT SUPPLIED BY THE AUTHORITY. ONCE TURNED OVER BY THE AUTHORITY, THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR THE EQUIPMENT AS INDICATED IN THE CONTRACT SPECIFICATIONS.
13. PRIOR TO PLACING ELECTRICAL/MECHANICAL EQUIPMENT ON-LINE, ALL TEST RESULTS INCLUDING SEQUENCE OF OPERATION, O&M MANUALS, AS-BUILT DRAWINGS, SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER.
14. ALL WORK REQUIRING SERVICE INTERRUPTIONS TO WINDOWS ON THE WORLD RESTAURANT SHALL BE PERFORMED OFF-HOURS BETWEEN 2AM-6AM.
15. HOISTING OF EQUIPMENT ON ELEVATORS IS LIMITED TO 50% OF THE CAR'S RATING. LOADS EXCEEDING THIS LIMIT WILL REQUIRE THE ASSISTANCE OF ACE ELEVATOR TO HANG THE CAR DURING LOADING AND UNLOADING. ANY SINGLE PIECE OF EQUIPMENT EXCEEDING 25% OF THE CAR'S RATING WILL ALSO REQUIRE THE CAR TO BE 'HUNG' BY ACE. CONTRACTOR SHALL HIRE ACE AS A SUB TO PERFORM THIS FUNCTION AND A QUOTE FROM ACE TO PERFORM THIS WORK WILL BE FORWARDED SHORTLY.
16. CONTRACTOR SHALL SUBMIT CONSTRUCTION SCHEDULE IDENTIFYING ALL SERVICE DISRUPTIONS INCLUDING ALL LOAD TRANSFERS (STRUCTURAL, MECHANICAL, ELECTRICAL) AND SHALL BE UPDATED ON A MONTHLY BASIS.
17. NET COST WORK:

    THE CONTRACTOR WILL BE REIMBURSED AT THE 'NET COST' FOR THE FOLLOWING:

    a) REPAIR OF EMBEDDED UTILITIES AND SERVICES

    b) REPLACEMENT OF CABLE NOT SHOWN ON THE CONTRACT DRAWINGS

    c) INSTALLATION OF ADDITIONAL STRUCTURAL SUPPORTS NOT REQUIRED UNDER THIS CONTRACT

    d) SLAB REPAIRS

    e) INCIDENTAL ASBESTOS ABATEMENT

    f) PROVIDING TEMPORARY POWER

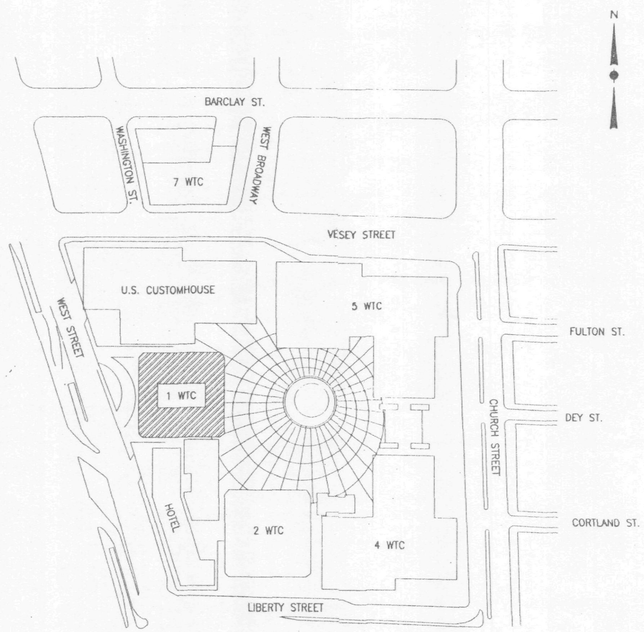
    g) REQUIRED RELOCATION NOT SHOWN

    'NET COST' SHALL BE PERCENTAGE ADDITION TO COST, AS SET FORTH IN THE CLAUSE OF THE CONTRACT PROVIDING COMPENSATION FOR EXTRA WORK. PERFORMANCE OF SUCH NET COST WORK SHALL BE SUBJECT TO ALL PROVISIONS OF THE CONTRACT RELATING TO PERFORMANCE OF EXTRA WORK. COMPENSATION FOR SAID NET COST WORK SHALL NOT BE CHARGED AGAINST THE TOTAL AMOUNT OF COMPENSATION AUTHORIZED FOR EXTRA WORK.
18. THE CONTRACTOR WILL BE REIMBURSED FOR THE FOLLOWING WORK AT "NET COST", SEE SPECIFICATIONS, FOR THE FOLLOWING WORK:

    a) REMOVAL RELOCATIONS AND/OR REPLACEMENT OF EXISTING UTILITY SERVICES WHICH ARE NOT INDICATED ON THE CONTRACT DRAWINGS AND WHICH OBSTRUCT THE INSTALLATION OF WORK OF THIS CONTRACT WHEN SO DIRECTED BY THE ENGINEER.

    b) THE SALVAGE, FOR USE BY THE AUTHORITY, OF COMPONENTS OF EXISTING ELECTRICAL EQUIPMENT WHICH ARE TO BE REMOVED AS PART OF THIS CONTRACT AND ARE NOT SPECIFICALLY MENTIONED IN THE SPECIFICATIONS OR ON THE DRAWINGS, WHEN SO DIRECTED BY THE ENGINEER.

    c) PROVIDING TEMPORARY ELECTRIC LIGHT AND/OR POWER TO TENANT AREAS DURING SHUTDOWNS OF ELECTRICAL SYSTEMS, WHEN SO DIRECTED BY THE ENGINEER.



SITE PLAN

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THE PORT AUTHORITY OF N.Y. & N.J.

ENGINEERING PROGRAM MANAGER WORLD TRADE

CHIEF ELECTRICAL ENGINEER

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

Title

ADDITIONAL SUBSTATION SS-108A, ON THE 108TH FLOOR AT ONE WTC

GENERAL NOTES AND SITE PLAN

This drawing subject to conditions in Contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

AVENOSO	AVENOSO	
Designed by	Drawn by	Checked by

December 4, 1998
Date

WTC-810.071 G-2
Contract Number Drawing Number

FILE NAME: Z:\CW2-111.222\Den's_Jobs\108 Sub Station\WTC-810 041 G-2.dwg plotted on 12/4/1998 by DAVENOSO

REVISION No. 9

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G-2	GENERAL NOTES AND SITE PLAN
G-3	INDEX OF DRAWINGS
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DWG No.	TITLE
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A-3	PARTIAL FLOOR PLAN 108TH FLOOR MEZZANINE LEVEL
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S-8	MECHANICAL EQUIPMENT SUPPORTS PLAN AND SECTIONS
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	PLUMBING
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THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER
WORLD TRADE

CHIEF ELECTRICAL ENGINEER

No.	Date	Revision	Approved

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

Title

ADDITIONAL SUBSTATION SS-108A, ON THE 108TH FLOOR AT ONE WTC

INDEX OF DRAWINGS

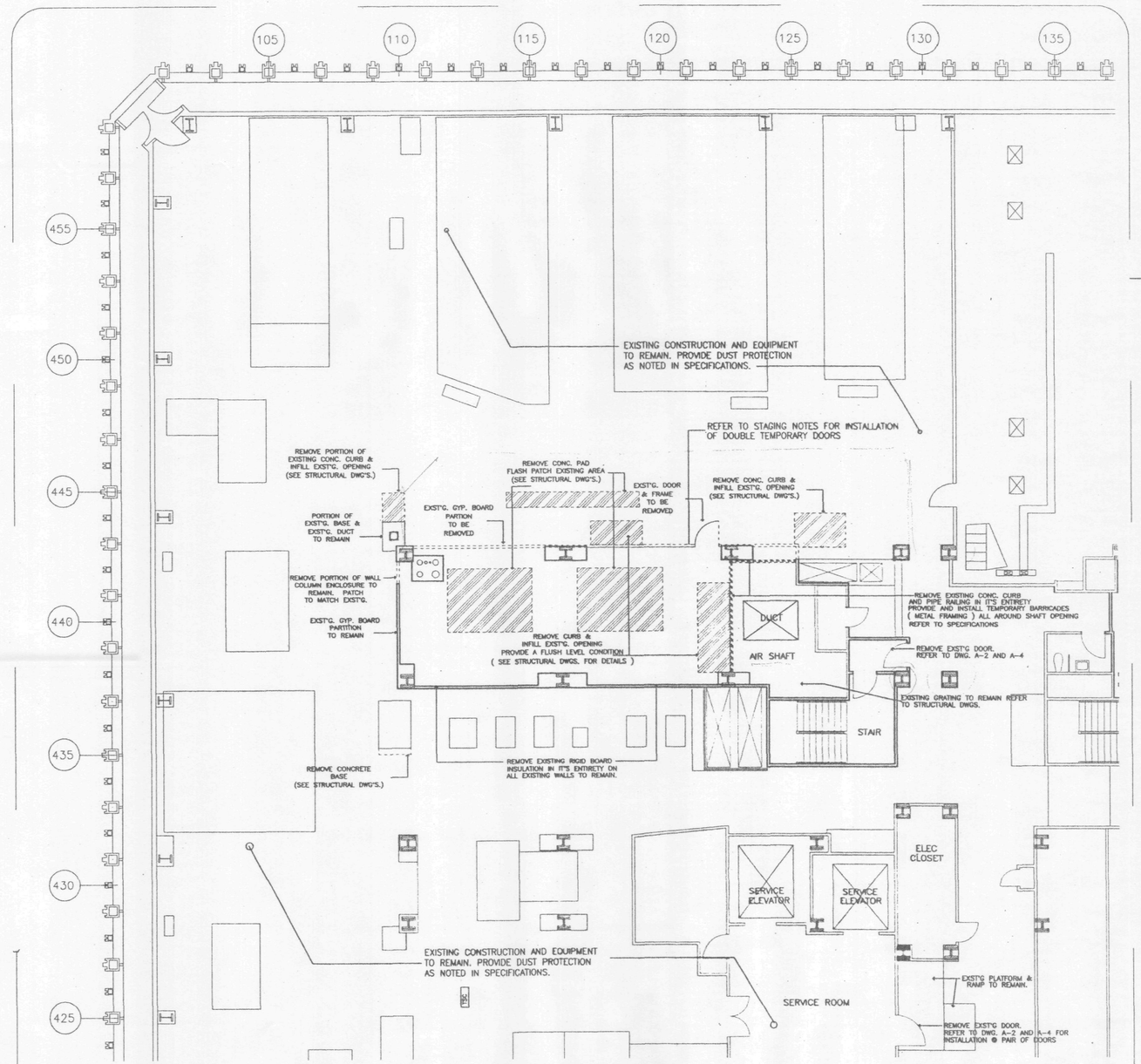
This drawing subject to conditions in Contract; All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

AVENOSO Designed by | AVENOSO Drawn by | Checked by

December 4, 1998
Date

WTC-810.071 Contract Number | G-3 Drawing Number

FILE NAME: Z:\CW2-111.222\Den's_Jobs\108 Sub Station\WTC-810 041 G-3.dwg plotted on 12/3/1998 by DAVENOSO



A / A-1 DEMO PLAN

SCALE

0 2 4 6 8 10

WORK AREA

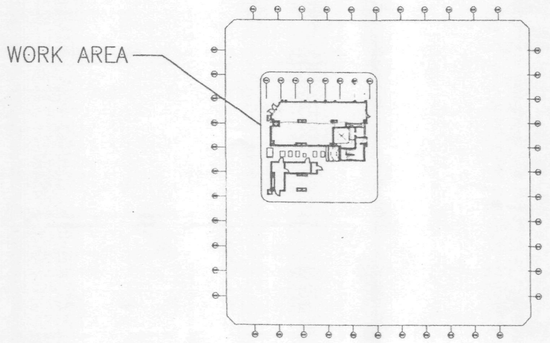
STAGING NOTES:

1. Coordinate all staging with the requirements of the Mechanical, Electrical and Structural Trades as approved and directed by the Engineer.
2. Remove existing single door to existing 108th Floor Plenum and install temporary double doors at this location - Stage I.
3. After erection of Mezzanine Sections, construct temporary partitions and doors to seal temporary Mezzanine Plenums - Stages II and III.
4. Construct door and partition existing air shaft to Mezzanine Plenum when required by Mechanical Trades - Stage III.
5. Demolish existing Plenum walls as indicated on Demolition Plan - Stage IV.
6. After completion of Mezzanine extension erect Substation 108A partitions and doors, permanent Mezzanine Plenum partitions and doors and demolish temporary work - Stage V.
7. Complete other miscellaneous work - Stage VI.

WALL LEGEND

EXISTING CONSTRUCTION TO REMAIN

EXISTING CONSTRUCTION TO BE REMOVED



PROJECT NORTH

KEY PLAN

NTS

Sheet 41 of 64

THE PORT AUTHORITY OF NY & NJ

CODY ECKERT & ASSOCIATES
51 Clarksville Road
Lawrenceville, New Jersey 08648
Tel 609.716.8500 Fax 609.716.8686

Cody A. Eckert

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NOT FOR PERMIT OR APPROVAL PURPOSES

REGISTERED ARCHITECT CODY ANN ECKERT 018903-1 STATE OF NEW YORK

No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION
SS-108A ON THE 108th FLOOR
AT ONE WTC

DEMOLITION PLAN
108th FLOOR

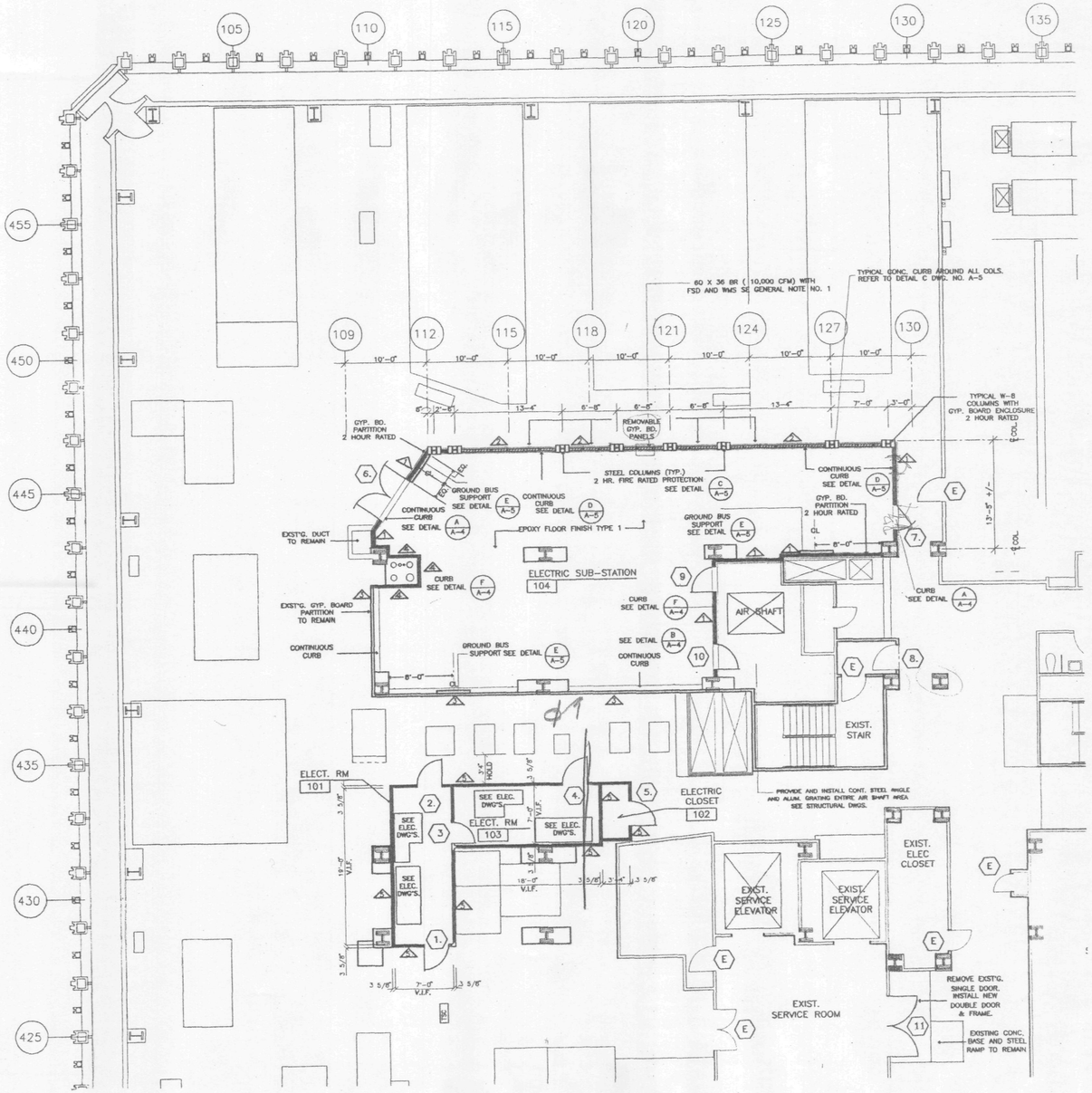
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Job Number: 98020

CF	CM	DWB
Designed by	Drawn by	Checked by

DECEMBER 4, 1998	AS SHOWN
Date	Scale

WTC810.071	A-1
Contract Number	Drawing Number



A/A-2 108TH FLOOR PLAN

SCALE 0 2 4 6 8 10

ROOM FINISH SCHEDULE

LOCATION				FLOOR	BASE	WALLS		CEILING	
TOWER	FLOOR	NO.	SPACE	FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH
ONE	108	101	ELECTRIC ROOM	PAINTED 4	VINYL	GYP. BD.	PAINTED	GYP. BD.	PAINTED
ONE	108	102	ELECTRIC CLOSET	PAINTED 4	VINYL	GYP. BD.	PAINTED	GYP. BD	PAINTED
ONE	108	103	ELECTRIC ROOM	PAINTED	VINYL	GYP. BD.	PAINTED	GYP. BD.	PAINTED
ONE	108	104	ELECTRIC SUB-STATION	EPOXY 1	EPOXY 1	GYP. BD.	PAINTED	EXPOSED	–
ONE	108	201	MEZZANINE	EPOXY 2	EPOXY 2	GYP. BD.	PAINTED	EXPOSED	–
ONE	108	202	MEZZANINE	EPOXY 2	EPOXY 2	GYP. BD.	PAINTED	EXPOSED	–

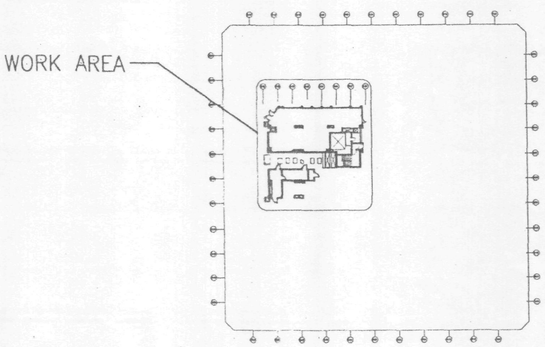
EPOXY 1 – DURAL INTERNATIONAL CORP. "DURALTEX LIGHT GRAY 3/8" THICK
EPOXY 2 – M-E FLOORING SYSTEM "DEX-O-TEX 3/16" THICK
WOVEN FABRIC REIN. MEMBRANE, TRAFFIC SURFACE COVE BASE
PAINT COLOR (INT.) "SHERWIN WILLIAMS" # 1004 PURE WHITE (SEMI-GLOSS)
PAINT COLOR (EXT.) MATCH EXISTING

PARTITION SCHEDULE

1. 3 5/8" 25 GA. GALV. STEEL STUDS @ 16" O.C. WITH 2 LAYERS 1/2" FIRECODE GYP. BD.UL # 412 (2 HR RATED) REFER TO DETAIL F DWG. NO. A-5
2. REMOVABLE GYP. BD. PANELS WITH FIXED PANELS ABOVE. REFER TO WALL SECTION DWG. NO. A-5 SECTION A. REMOVABLE PANEL UNITS SHALL EE NO GREATER THAN 2'-0" IN WIDTH FIRE CAULK AT ALL JOINTS.
3. EXISTING 2 HR RATED WALL (UL DESIGN # U 438 INSTALL 1/2" G.W.B. FIRECODE FULL HT OF WALL TAPE, SPACKLE, SAND AND PAINT.
4. [illegible] WALL FULL HT. [illegible] # 438 [illegible] HR RATED)
5. PARTITION HT. – 9'-6" 3 5/8" 20GA GALV. STEEL STUDS @ 16" O.C. WITH (2) LAYERS 1/2" FIRECODE G.W.B. UL # 412 (2 HR RATED) WITH ROOF – 4" 16GA. GALV. STEEL JOISTS @ 16" O.C. WITH (2) LAYERS 1/2" FIRECODE G.W.B. UL # U412 (2 HR RATED)

GENERAL NOTES:

1. GENERAL CONTRACTOR TO COORDINATE OPENINGS AND PENETRATIONS IN ALL PARTITIONS WITH MECHANICAL CONTRACTOR FOR SIZES AND LOCATIONS. MECHANICAL CONTRACTOR TO PROVIDE AND INSTALL REMOVABLE 60X36 BR LOCATED IN REMOVABLE GYP. BD. PARTITION PANELS. V.I.F. EXACT LOCATION.
2. WHERE REMOVALS ARE MADE TO EXISTING CONC. REMOVE 2" TOPPING MIN.8" BEYOND REMOVAL AREA FOR OVER LAP OF WATERPROOFING.
   G.C. TO PROVIDE UL# OF ALL SAFING MATERIALS USED IN FIRE ASSEMBLIES.
4. FIRE CAULK ALL JOINTS OF FIRE PARTITIONS AND CEILING PANELS.
5. G.C. TO PROVIDE AND INSTALL 'USG' OR EQUAL THERMAFIBER SAFING INSULATION SAFING IMPALING CLIPS AND SMOKE SEAL COMPOUND AT ALL JOINTS CONFORMING TO UL # 165 @ PERIMETER OF MEZZANINE CONC. FLOOR AND EXISTING 2HR RATED PARTITIONS AND ALL PIPE AND CONDUIT PENETRATIONS. REFER TO DWGS. AND DETAILS FOR LOCATIONS.
6. DOOR NO. 12 TO PLENUM SHALL RECEIVE GASKET APPLIED AT HEAD AND JAMBS EQUAL TO # 328 FSG AS MANF. BY 'ZERO INTERNATIONAL'.
7. METAL FASCIA PANELS INDICATED IN 107th FLOOR CEILING MODIFICATIONS SHALL BE EQUAL TO 'COMPASSO SUSPENSION TRIM' AS MANF. BY 'USGINTERIORS INC.COLOR OT MATCH.



PROJECT NORTH

KEY PLAN
NTS

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REGISTERED ARCHITECT CODY ANN ECKERT 21800 STATE OF NEW YORK

No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION SS-108A ON THE 108th FLOOR AT ONE WTC

PARTIAL FLOOR PLAN 108th FLOOR LOWER LEVEL

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

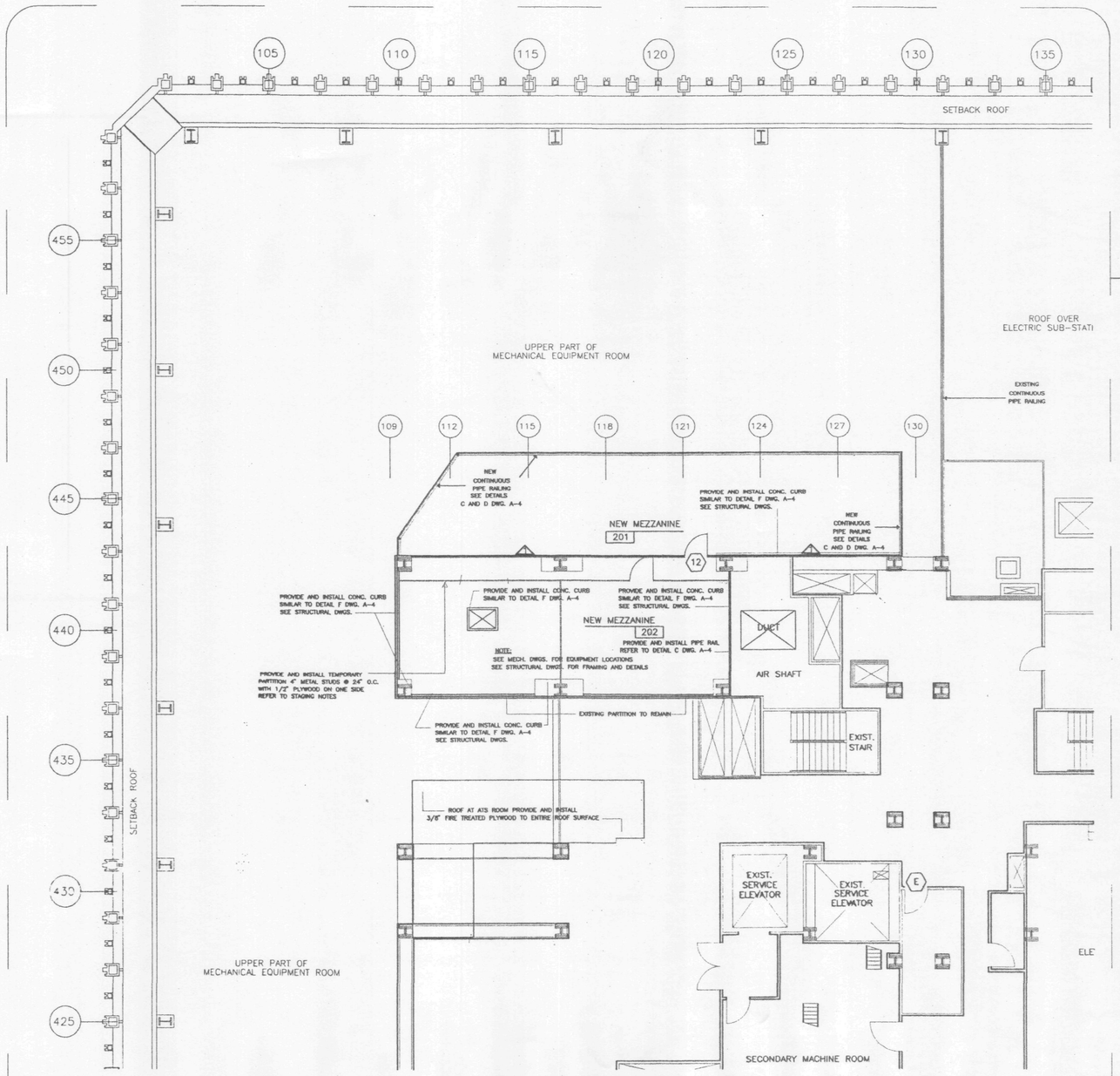
Job Number: 98020

CF	CM	DWB
Designed by	Drawn by	Checked by

DECEMBER 4, 1998	AS SHOWN
Date	Scale

WTC810.071	A-2
Contract Number	Drawing Number

Sheet 43 of 66



A/A-3 MEZZANINE PLAN

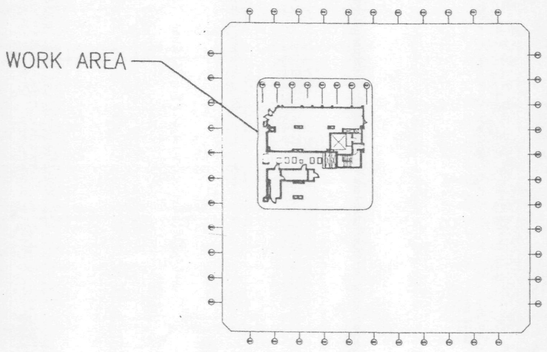
SCALE

0 2 4 6 8 10

42 x.

PARTITION SCHEDULE

1 3 5/8" 25 GA. GALV. STEEL STUDS @ 16" O.C. WITH 2 LAYERS 1/2" FIRECODE GYP. BD.UL # 412 (2 HR RATED).



PROJECT NORTH KEY PLAN

NTS

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No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION SS-108A ON THE 108th FLOOR AT ONE WTC

PARTIAL FLOOR PLAN 108th FLOOR MEZZANINE LEVEL

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Job Number: 98020

CF	CM	DWB
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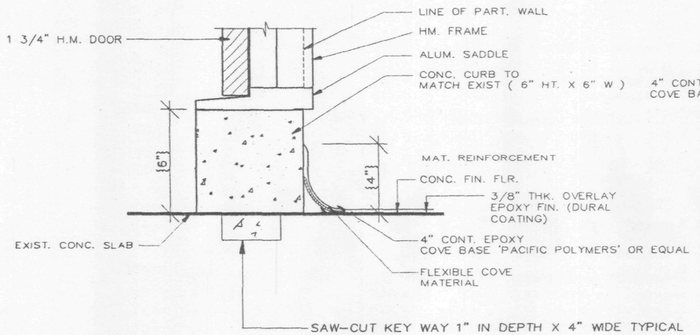
DECEMBER 4, 1998	AS SHOWN
Date	Scale

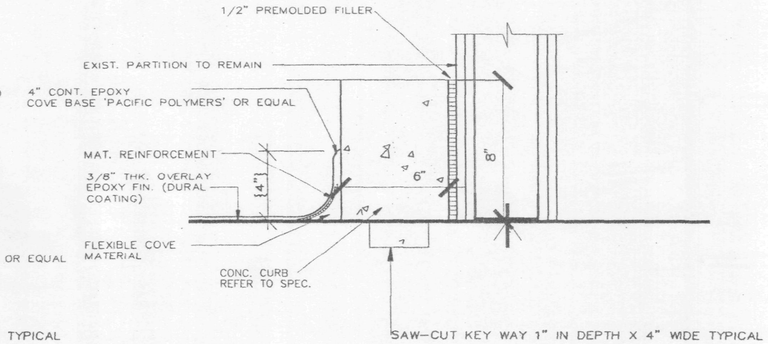
WTC810.071	A-3
Contract Number	Drawing Number

NOTES

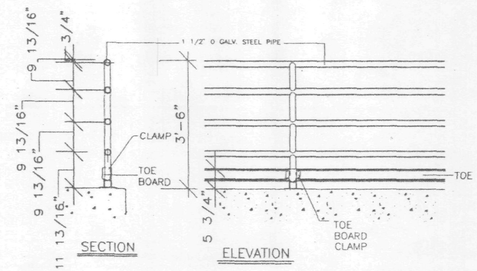
1. CLEAN AND ROUGHEN EXISTING CONCRETE SLAB AND APPLY COAT OF EPOXY BONDING CEMENT UNDER ALL THE NEW CONCRETE CURBS.



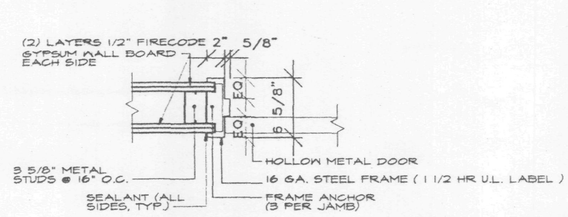
A A-4 CONC. CURB DETAIL @ DOOR (TYP.)
SCALE: 3" = 1'-0"



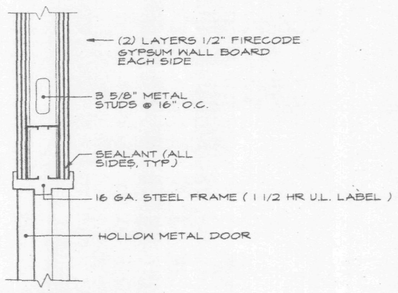
B A-4 COVE BASE DETAIL (TYP.) @ EXISTING WALLS
SCALE: 3" = 1'-0"



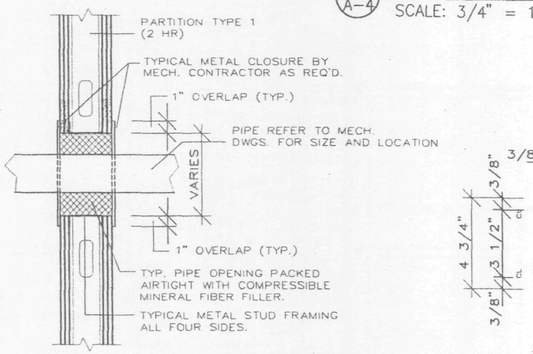
C A-4 PIPE RAIL DETAIL
SCALE: 3/4" = 1'-0"



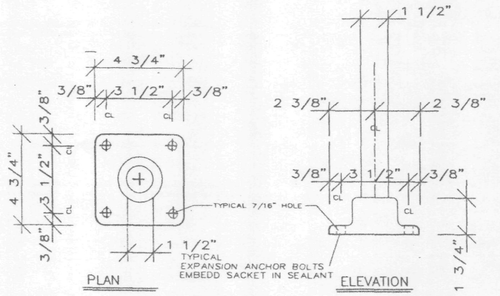
1 JAMB DETAIL
1 1/2" = 1'-0"



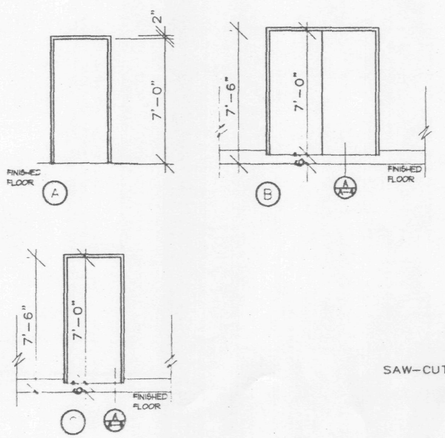
2 HEAD DETAIL
SCALE: 1 1/2" = 1'-0"



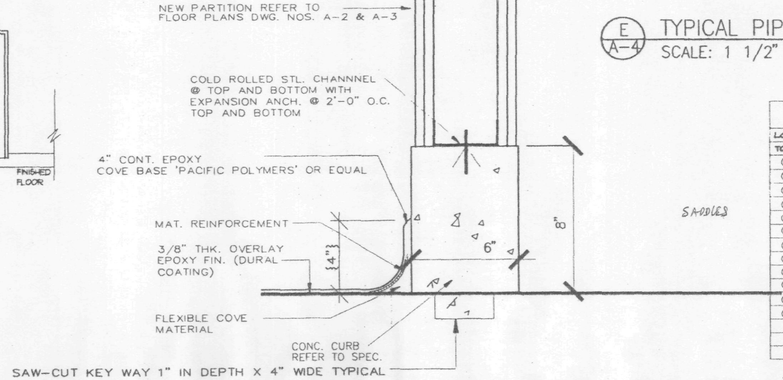
E A-4 TYPICAL PIPE PENETRATION
SCALE: 1 1/2" = 1'-0"



D A-4 HEAVY DUTY FLOOR FLANGE DETAIL
SCALE: 3" = 1'-0"



3 DOOR TYPES
SCALE: 1/4" = 1'-0"



F A-4 TYPICAL BASE DETAIL @ NEW WALL
SCALE: 3" = 1'-0"

DOOR AND FRAME SCHEDULE

LOCATION			DOOR					FRAME				HARDWARE SET NO.	REMARKS
TOWER	FLOOR	NO.	WIDTH	HEIGHT	THICK.	MATERIAL	TYPE	FIRE LABEL	JAMB DTL.	HD DTL.	MATERIAL		
ONE	108	1	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	2	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	3	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	4	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	5	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	6	6'-0"	7'-0"	1 3/4"	HM	B	1 1/2hr	1	2	HM		(1)
ONE	108	7	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		(1)
ONE	108	8	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		
ONE	108	9	3'-0"	7'-0"	1 3/4"	HM	C	1 1/2hr	1	2	HM		(1)
ONE	108	10	3'-0"	7'-0"	1 3/4"	HM	C	1 1/2hr	1	2	HM		(1)
ONE	108	11	6'-0"	7'-0"	1 3/4"	HM	B	1 1/2hr	1	2	HM		
ONE	108	12	3'-0"	7'-0"	1 3/4"	HM	A	1 1/2hr	1	2	HM		(2)

REMARKS:

(1) NOTE 6" RAISED CONCRETE CURB DOOR HEAD HEIGHT IS 7'-6" ABOVE FIN. FL.

(2) GASKET DOOR AT HEAD AND JAMB

HARDWARE SET # 1

- BUTT HINGES EQUAL TO STANLEY FBB179, US26D, 1 1/2 PAIR PER DOOR LEAF.
- LOCKSET EQUAL TO YALE SERIES 8700 MORTISED LOCKSET, AUGUSTA, US26D.
- FLUSH BOLTS EQUAL TO GLYNN-JOHNSON 1 PER INACTIVE LEAF, US26D, AT PR DOORS.
- DOOR STOPS EQUAL TO GLYNN-JOHNSON, GREY RUBBER, US26D. (AS REQUIRED)
- SILENCERS EQUAL TO GLYNN-JOHNSON, GREY RUBBER, 4 PER DOOR LEAF
- CLOSER EQUAL TO NORTON MODEL # 8400.

Sheet 44 of 66

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REGISTERED ARCHITECT CODY ANN ECKERT 21869-1 STATE OF NEW YORK

No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION SS-108A ON THE 108th FLOOR AT ONE WTC

MISCELLANEOUS DETAILS -1

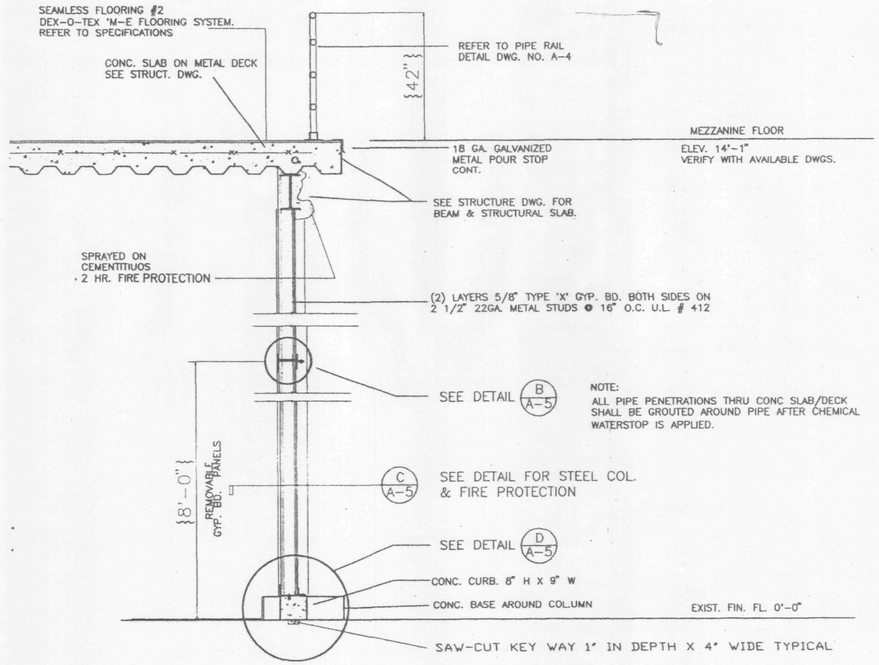
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Job Number 98020

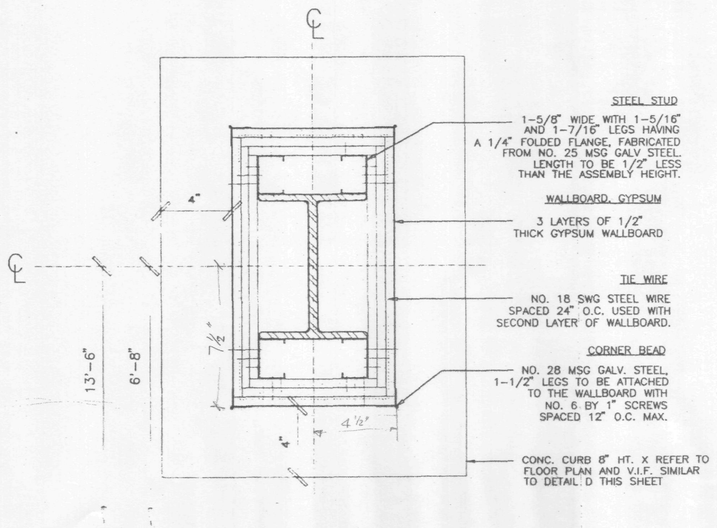
CF	CM	DWB
Designed by	Drawn by	Checked by

DECEMBER 4,1998 — Date
AS SHOWN — Scale

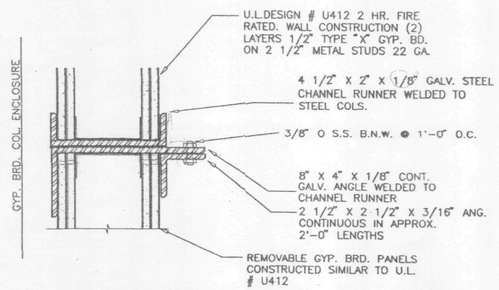
WTC-810.071 — Contract Number
A-4 — Drawing Number



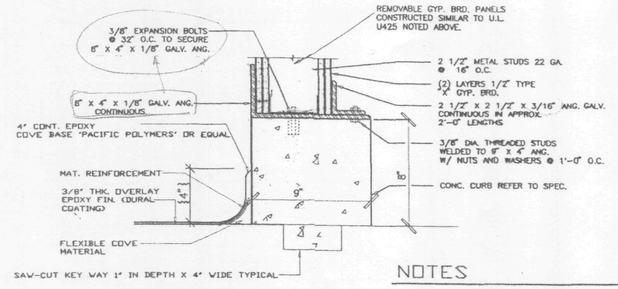
A A-5 WALL SECTION @ REMOVABLE PARTITION
SCALE: 1/2" = 1' - 0"



C A-5 HORIZONTAL SECTION THRU COLUMN
SCALE: 3" = 1' - 0" UL DES. NO. X528



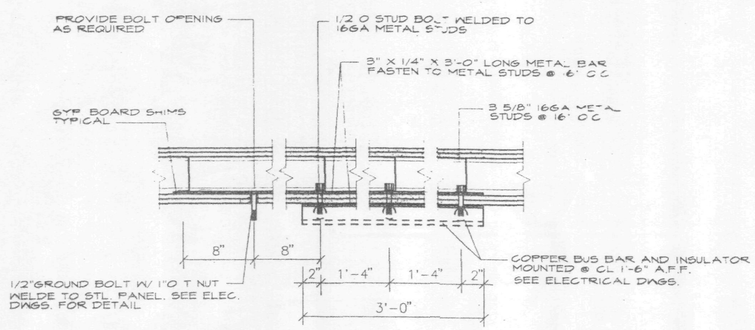
B A-5 HEAD DETAIL @ REMOVABLE TO FIXED PANEL
SCALE: 3" = 1' - 0"



NOTES

1. CLEAN AND ROUGHEN EXISTING CONCRETE SLAB AND APPLY COAT OF EPOXY BONDING CEMENT UNDER ALL THE NEW CONCRETE CURBS.

D A-5 BASE DETAIL @ REMOVABLE PARTITION
NTS



E A-5 GROUND BUS SUPPORT BAR DETAIL
SCALE: SCALE: 1 1/2" = 1'-0"

Sheet 45 of 66

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No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION
SS-108A ON THE 108th FLOOR
AT ONE WTC

MISCELLANEOUS
DETAILS - 2

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Job Number: 98020

CF	CM	DWB
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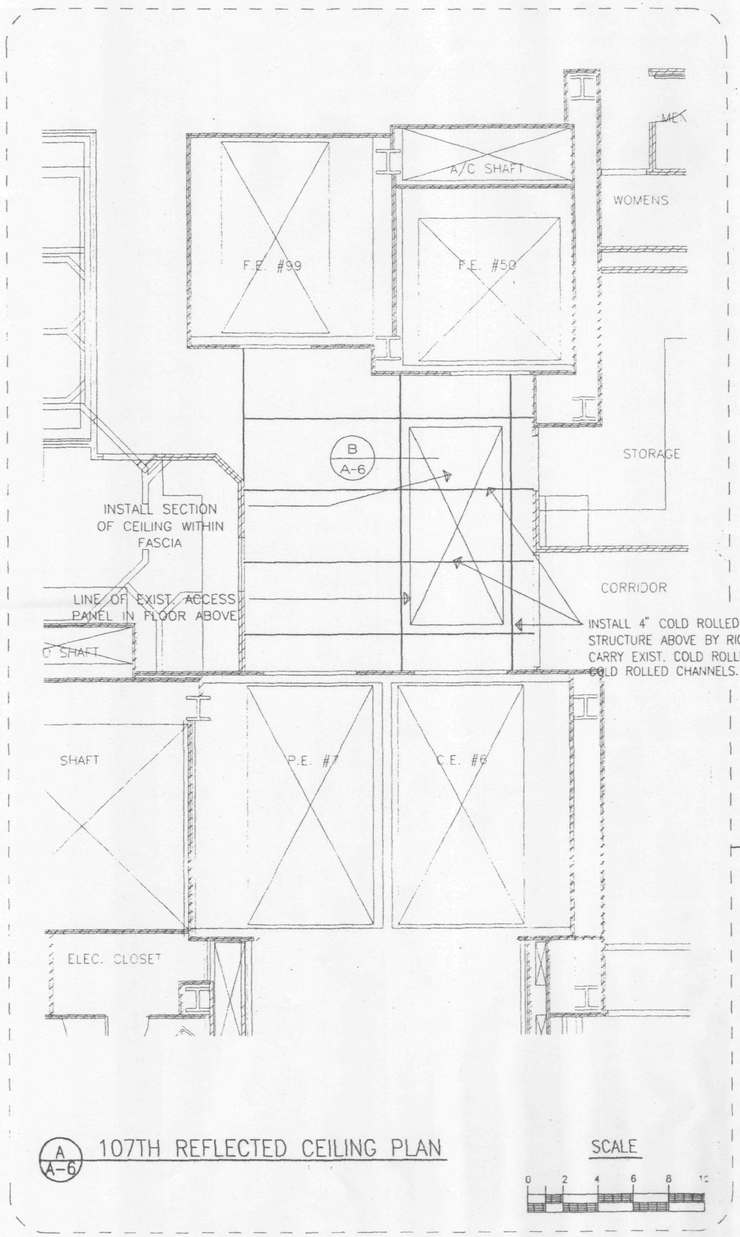
DECEMBER 4, 1998	AS SHOWN
Date	Scale

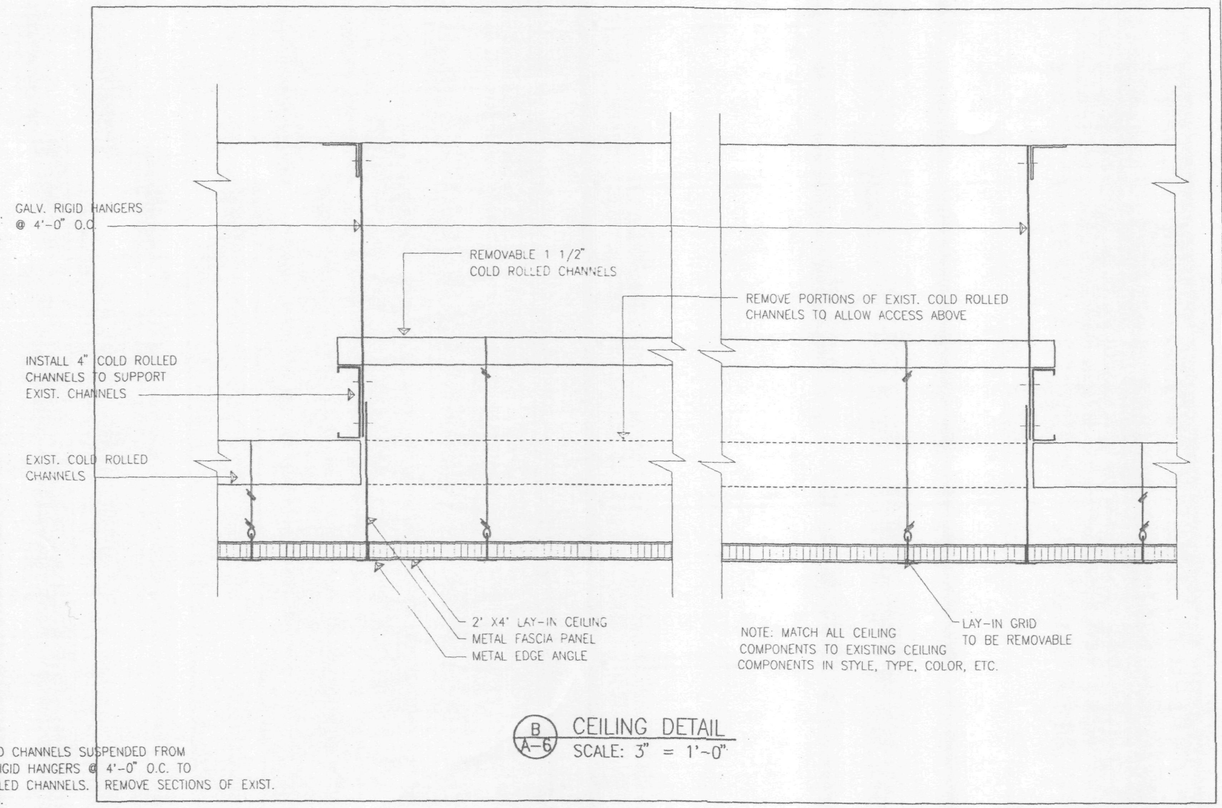
WTC810.071	A-5
Contract Number	Drawing Number



A/A-6 107TH REFLECTED CEILING PLAN

SCALE

0 2 4 6 8 1

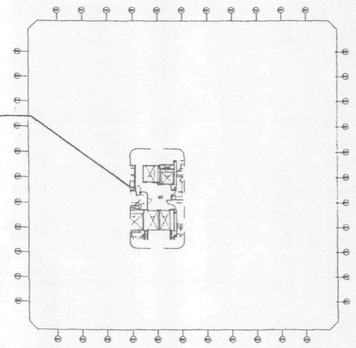


B/A-6 CEILING DETAIL
SCALE: 3" = 1'-0"

GENERAL NOTE:

WORK IN FEIGHT ELEVATOR LOBBY SHALL BE PERFORMED DURING THE HOURS OF 12 MIDNIGHT TO 6AM. PROVIDE TEMPORARY PROTECTION DURING CONSTRUCTION TO PREVENT DUST AND ODORS FROM ENTERING ADJACENT SPACES. REFER TO SPECIFICATIONS.

WORK AREA



PROJECT NORTH

KEY PLAN
NTS

Sheet 46 of 66

THE PORT AUTHORITY OF NY & NJ

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No.	Date	Revision	Approved

Engineering Department

WORLD TRADE CENTER

ARCHITECTURAL

Title

ADDITIONAL SUBSTATION SS-108A ON THE 108th FLOOR AT ONE WTC

PARTIAL CEILING PLAN DETAILS 107th FLOOR

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Job Number: 98020

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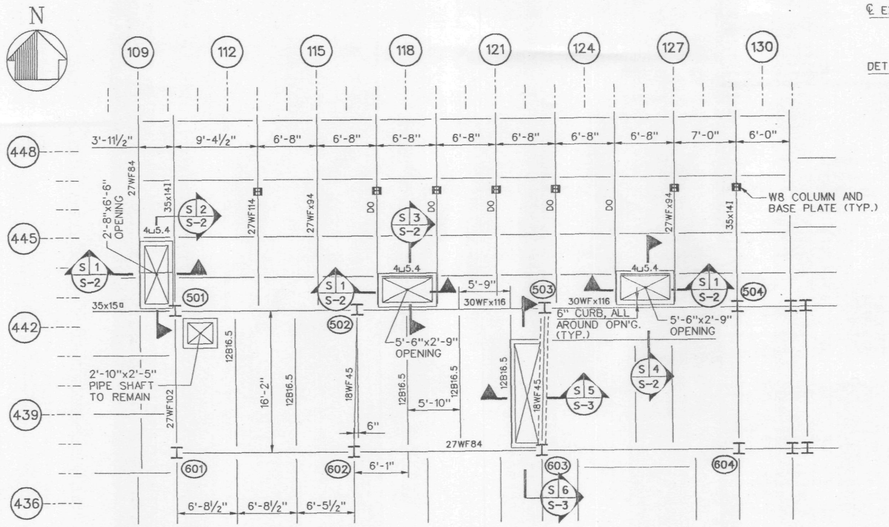
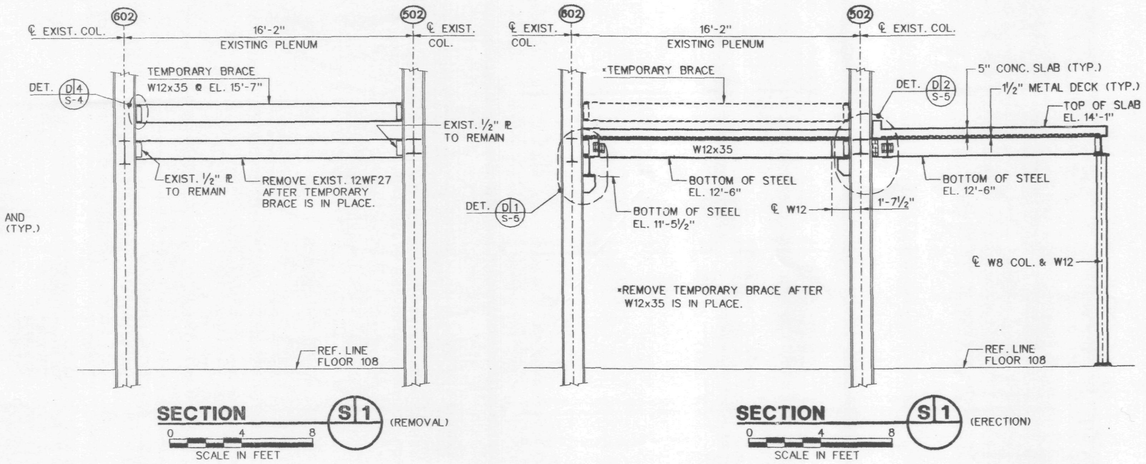
DECEMBER 4, 1998 (Date) AS SHOWN (Scale)

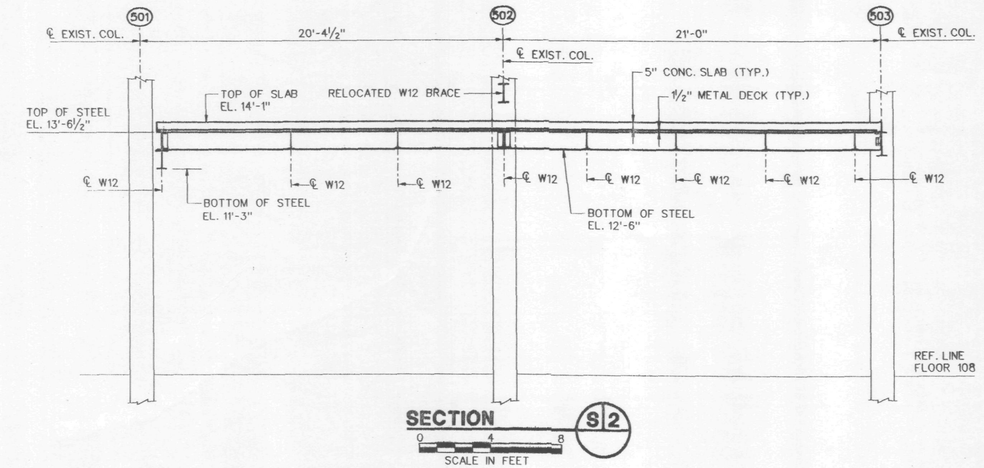
WTC810.071 (Contract Number) A-6 (Drawing Number)

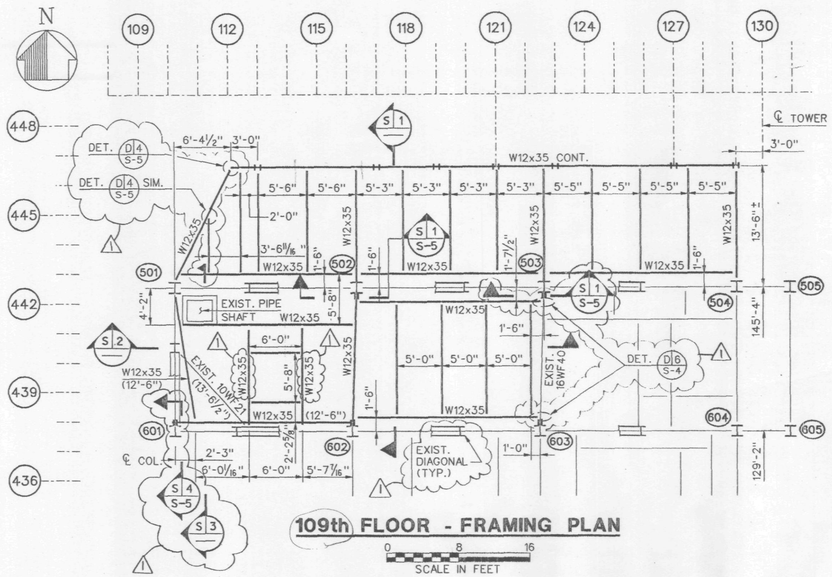


108th FLOOR - EXISTING FRAMING PLAN

SCALE IN FEET 0 8 16

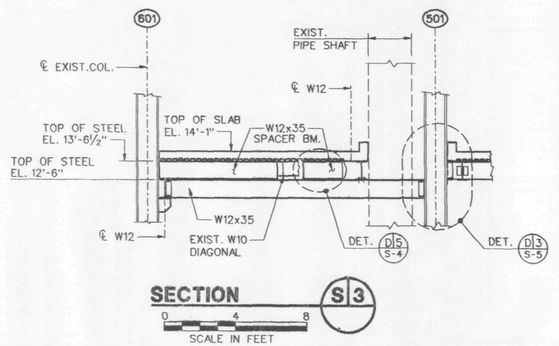






109th FLOOR - FRAMING PLAN

SCALE IN FEET 0 8 16



FRAMING NOTES:

1. TOP OF STEEL EL. 13'-6½" ABOVE REFERENCE LINE FLOOR 108 UNLESS OTHERWISE NOTED.
2. ALL STEEL W12x19 UNLESS OTHERWISE NOTED.
3. ALL COLUMNS W8x24.
4. LOCATION OF BEAM SPLICES TO BE CHOSEN BY CONTRACTOR. SEE DETAIL ON DWG. S-4.

LEGEND:

■ DENOTES WELDED BRACKET CONNECTION

( ) DENOTES TOP OF STEEL ELEVATION

NOTES:

1. FOR STRUCTURAL NOTES SEE DRAWING S-4.
2. REFERENCE LINE EQUALS TOP OF FINISH FLOOR 108 EL. 1631'-10".

Sheet Of

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY C.Y. CHU
ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	CY

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

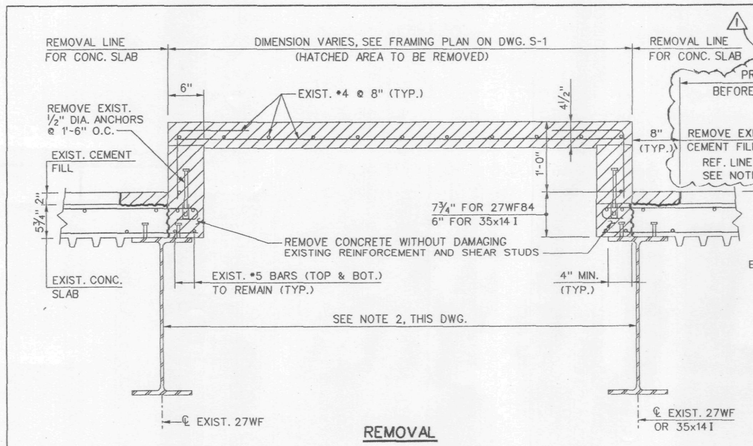
FRAMING PLANS AND SECTIONS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

S.MARTINEZ
P.PANICALI B.YOSTPILLE
Designed by Drawn by Checked by

12/4/98
Date

WTC-810.071 S-1
Contract Number Drawing Number



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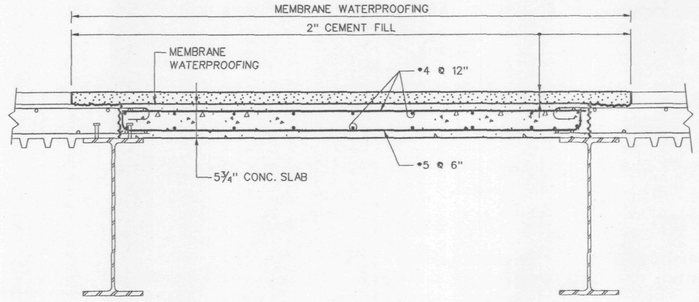
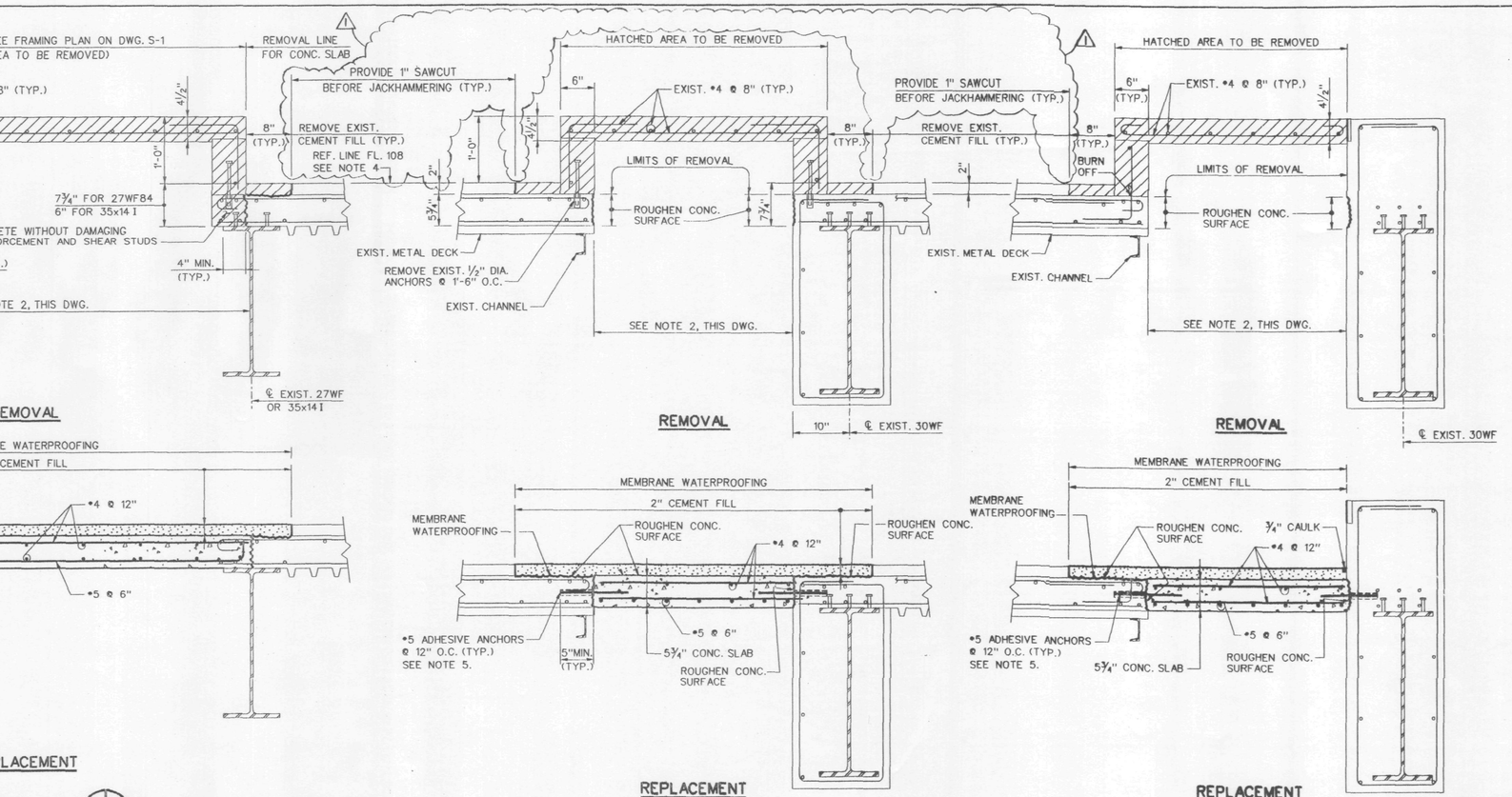


REPLACEMENT

SECTION S|1



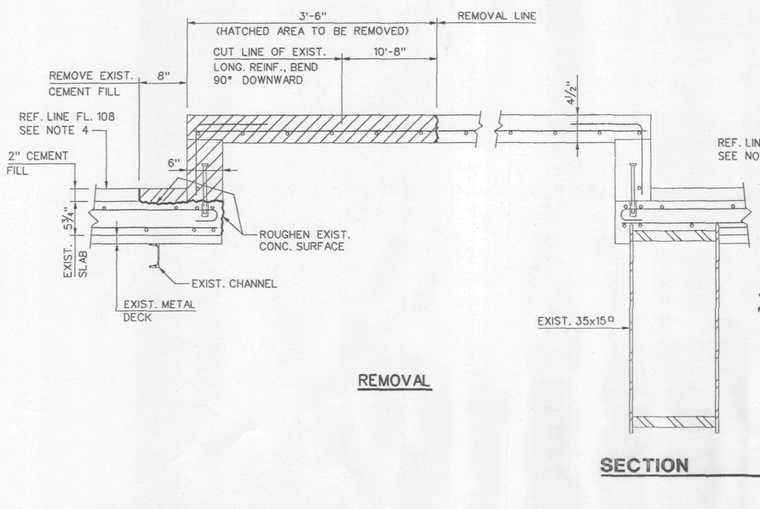
REMOVAL

REPLACEMENT

SECTION S|3

REPLACEMENT

SECTION S|4



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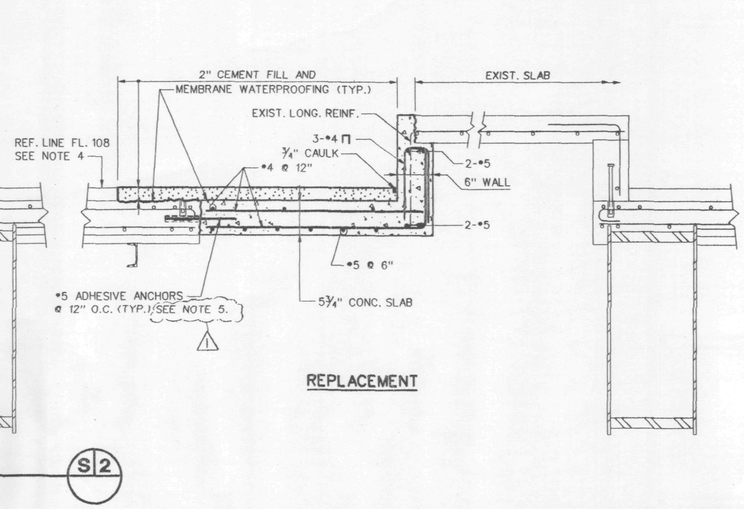

REPLACEMENT

SECTION S|2

NOTES:

1. FOR STRUCTURAL NOTES SEE DWG. S-4.
2. CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT DEBRIS FROM FALLING TO THE 107th FLOOR, DURING SLAB REMOVAL AND REPLACEMENT OPERATIONS.
3. FOR WATERPROOFING DETAILS SEE ARCHITECTURAL DRAWINGS.
4. REFERENCE LINE EQUALS TOP OF FINISH FLOOR 108 EL. 1631'-10".
5. ADHESIVE ANCHOR SHALL BE TYPE HVA BY HILTI CORP. OR APPROVED EQUAL.

0 1 2
SCALE IN FEET
TYPICAL UNLESS NOTED

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ORIGINAL SIGNED BY C.Y. CHU
ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	Cy

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

108th FLOOR SLAB SECTIONS AND DETAILS

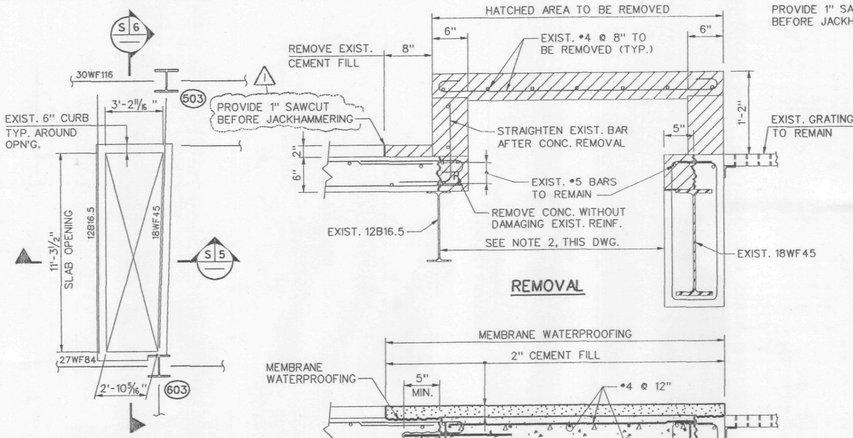
This drawing subject to conditions in contract. *All inventions, ideas, designs and methods* herein are reserved to Port Authority and may not be used without its written consent.

S.MARTINEZ
P.PANICALI B.YOSTPILLE
Designed by Drawn by Checked by

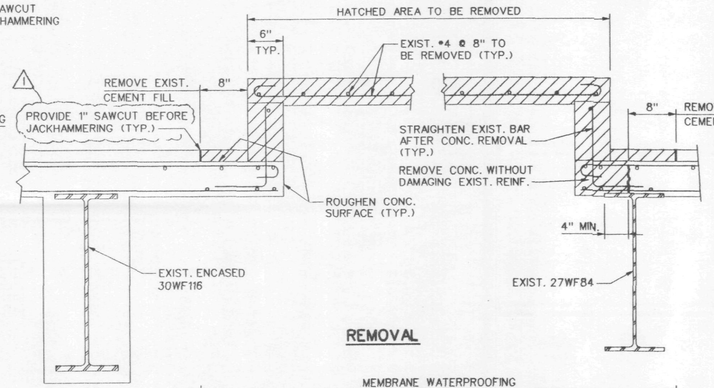
12/4/98
Date

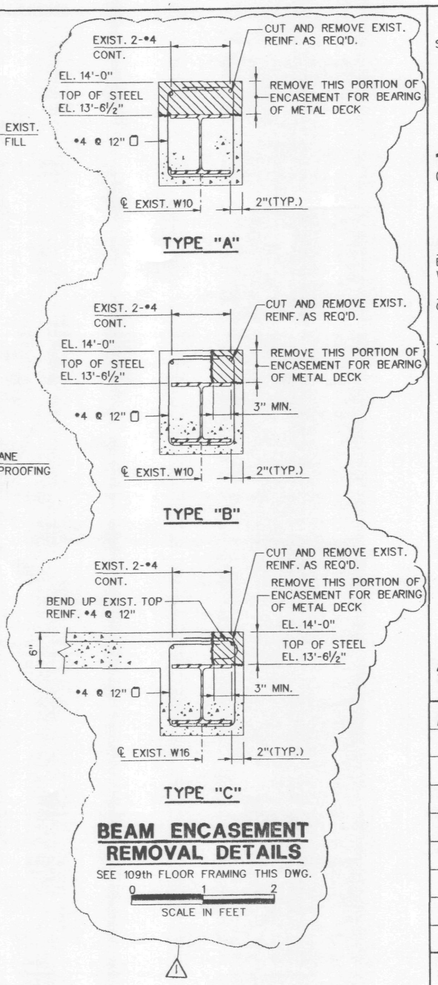
WTC-810.071 S-2
Contract Number Drawing Number

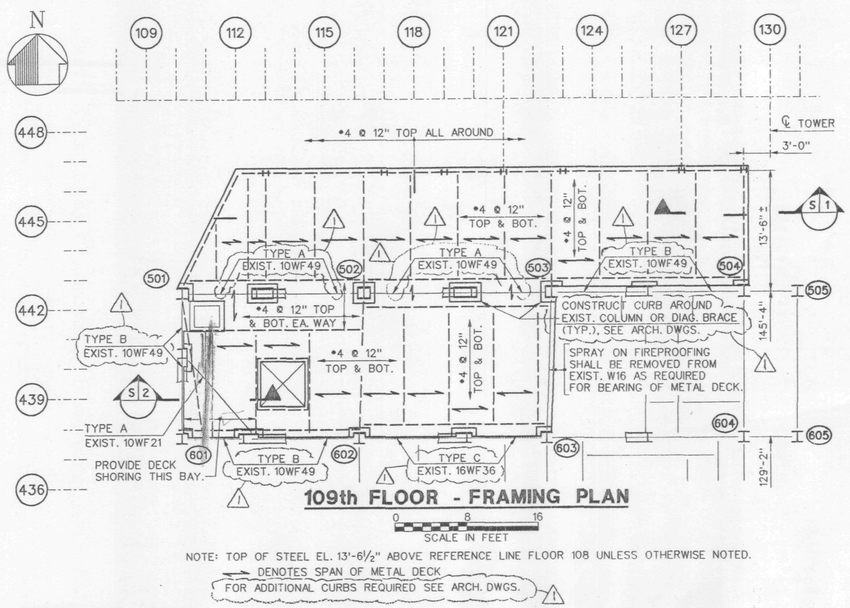
c:\str\wtc\810071\stage3\98s-2a.rd Jan. 22, 1999 10:34:54



PROVIDE 1" SAWCUT BEFORE JACKHAMMERING







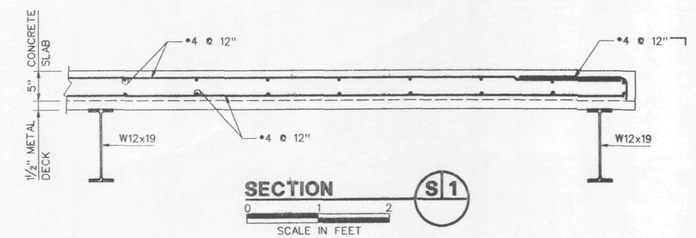
NOTE: TOP OF STEEL EL. 13'-6 1/2" ABOVE REFERENCE LINE FLOOR 108 UNLESS OTHERWISE NOTED.

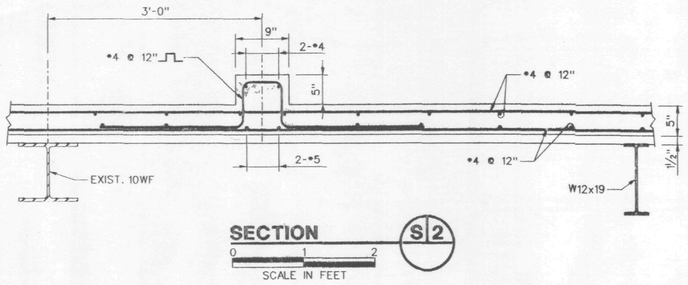
⟷ DENOTES SPAN OF METAL DECK FOR ADDITIONAL CURBS REQUIRED SEE ARCH. DWGS. (1)

METAL DECK NOTES:

METAL DECKING SHALL BE 18 GAUGE 1 1/2" TYPE B-LOK AS MANUFACTURED BY USD OR APPROVED EQUAL. PROVIDE EDGE SUPPORTS AT OPENINGS AS REQUIRED.

METAL DECK SHALL BE FASTENED TO STRUCTURAL STEEL WITH #12 SELF-TAPPING SCREWS AT EACH RIB. SIDELAP FASTENERS SHALL BE #10 SELF-TAPPING SCREWS (2 PER SPAN).





NOTES:

1. FOR STRUCTURAL NOTES SEE DWG. S-4.
2. CONTRACTOR SHALL TAKE THE NECESSARY PRECAUTIONS TO PREVENT DEBRIS FROM FALLING TO THE 107th FLOOR, DURING SLAB REMOVAL AND REPLACEMENT OPERATIONS.
3. FOR WATERPROOFING DETAILS SEE ARCHITECTURAL DRAWINGS.
4. REFERENCE LINE EQUALS TOP OF FINISH FLOOR 108 EL. 1631'-10".
5. (1) ADHESIVE ANCHORS SHALL BE TYPE HVA BY HILTI CORP. OR APPROVED EQUAL.

Sheet Of

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY C.Y. CHU
ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	cy

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

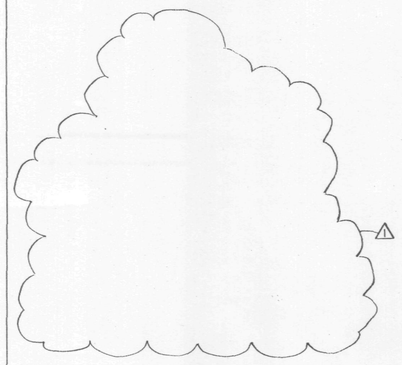
108th AND 109th FLOOR SLABS PLANS AND SECTIONS

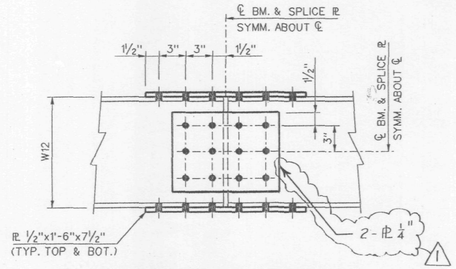
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

S.MARTINEZ | P.PANICALI | B.YOSTPILLE
Designed by | Drawn by | Checked by

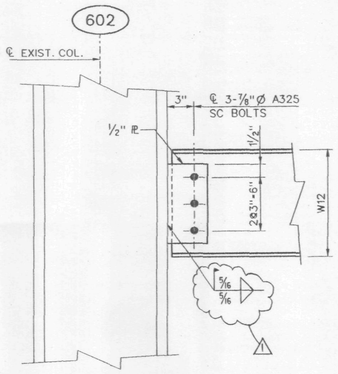
12/4/98
Date

WTC-810.071 — Contract Number
S-3 — Drawing Number

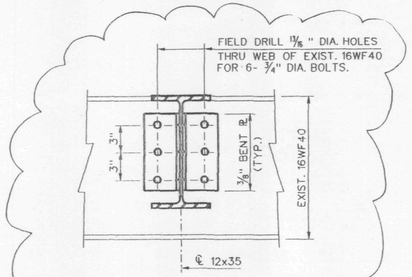




BEAM SPLICE DETAIL



DETAIL D/4 S-1



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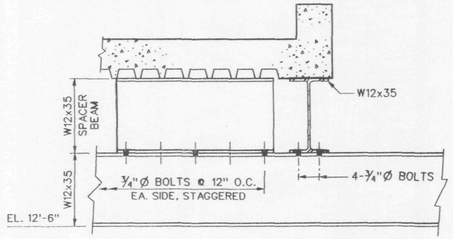

DETAIL D/5 S-1
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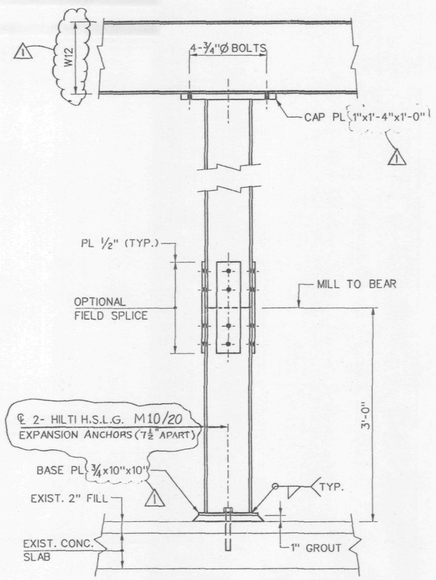
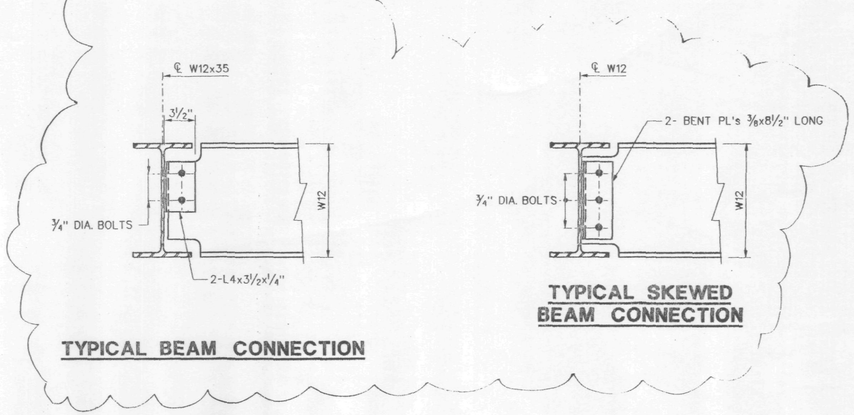
SCALE IN FEET



COLUMN - OPTIONAL SPLICE DETAIL

0 1 2
SCALE IN FEET



TYPICAL BEAM CONNECTION

TYPICAL SKEWED BEAM CONNECTION

STRUCTURAL NOTES:

1. THE CONTRACTOR SHALL CONDUCT A SURVEY OF EXISTING CONDITIONS IN ALL AREAS OF WORK. SUBMIT THE SURVEY TO THE ENGINEER FOR REVIEW. VERIFY ALL CONDITIONS AND DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS, INCLUDING ELEVATIONS OF EXISTING STRUCTURAL STEEL. THE SURVEY SHALL IDENTIFY ANY DISCREPANCY BETWEEN THE ACTUAL CONDITIONS AND THOSE SHOWN ON THE CONTRACT DRAWINGS .
2. DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT NEW YORK CITY BUILDING CODE.
3. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 AND SHALL BE FIRE-PROOFED IN ACCORDANCE WITH THE ARCHITECTURAL DRAWINGS. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500 GR.B, Fy= 46ksi.
4. ALL BOLTED CONNECTIONS SHALL BE MADE ¾" DIAMETER ASTM A325 SLIP CRITICAL (CLASS A) BOLTS UNLESS OTHERWISE NOTED.
5. A. WELDING SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT AMERICAN WELDING SOCIETY STRUCTURAL WELDING CODE - STEEL (AWS D1.1)
   B. THE CONTRACTOR SHALL PERFORM ULTRASONIC TESTING (AS PER AWS D1.1) ON ALL FILLET WELDS TO EXISTING STEEL COLUMNS AND ON WELDS TO EXISTING BEAMS AS DIRECTED BY THE ENGINEER. ALSO SEE SPECIFICATION SECTION 05120, PART 3.03 .
   C. A PREHEAT AND INTERPASS TEMPERATURE OF 150° TO 300° F IS REQUIRED FOR ALL WELDS TO EXISTING COLUMNS .
   D. ALL WELDS SHALL BE MADE WITH E-7018 LOW-HYDROGEN ELECTRODES.
   E. ALL WELDS SHALL BE THOROUGHLY INSPECTED ACCORDING TO THE REQUIREMENTS OF AWS D1.1.
   F. THE CONTRACTOR SHALL PROVIDE THE PANYNJ WITH A WELDING PROCEDURE SPECIFICATION (WPS)(ANNEX AWSD1.1) SPECIFYING ALL PROPOSED WELDING VARIABLES, INCLUDING THE PREHEAT TEMPERATURE AND WELDING ELECTRODE.
   G. THE MINIMUM SIZE OF FILLET WELDS SHALL BE ¼" UNLESS OTHERWISE NOTED .
   H. THE CONTRACTOR SHALL EMPLOY SMOKE CONTROL EQUIPMENT TO CONTROL SMOKE GENERATED BY WELDING OR BURNING IN THE PLENUM AREA .
6. GROUT SHALL BE NON-SHRINK TYPE AS PER SPECIFICATION SECTION 05120.
7. ALL CONCRETE SHALL BE LIGHTWEIGHT CONCRETE CLASS "LB" (F'c= 4,000 PSI).
8. ALL REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 .
9. DURING CONCRETE REMOVAL, THE EXISTING WELDED SHEAR STUDS ON EXISTING STRUCTURAL STEEL SHALL REMAIN UNDAMAGED.
10. ANY FIREPROOFING REMOVED DURING CONSTRUCTION OPERATIONS SHALL BE REPLACED IN KIND.
11. SEAL GAPS BETWEEN THE CONCRETE SLAB AND EXISTING STEEL MEMBER PENETRATIONS AT THE 109 TH FLOOR LEVEL WITH FIRESTOP. SEE ARCHITECTURAL DRAWINGS.
12. IF CONCRETE IS MIXED ON SITE, A MINIMUM OF TWO PORTABLE MIXERS WITH A MAXIMUM CAPACITY OF (6 C.F.) SHALL BE USED. IF THE LIGHTWEIGHT CONCRETE IS MIXED AT THE SITE, THE CEMENT COMPONENT SHALL BE ADDED AT THE SITE.
13. THE GENERAL CONTRACTOR SHALL COORDINATE THE SEQUENCE OF THE STRUCTURAL WORK WITH THAT OF OTHER TRADES.
14. THE MAXIMUM LENGTH OF STRUCTURAL MEMBERS WHICH CAN FIT ON THE ELEVATOR IS 12 FEET.
15. CONTROLLED INSPECTIONS SHALL BE CONDUCTED BY THE ENGINEER FOR THE FOLLOWING CONSTRUCTION AND OPERATIONS IN ACCORDANCE WITH THE TABLES 10-1 AND 10-2 OF SUBCHAPTER 10/"STRUCTURAL WORK" OF NEW YORK CITY BUILDING CODE:
   A. STEEL CONSTRUCTION
      a. WELDING OF STRUCTURAL STEEL
      b. INSTALLATION AND TENSIONING OF HIGH-STRENGTH BOLTS
   B. CONCRETE CONSTRUCTION
      a. MATERIAL CONFORMANCE TO ACI AND ASTM STANDARDS FOR STRENGTH, CEMENT, AGGREGATES, MIXING WATER, STEEL REINFORCEMENT AND ADMIXTURES.
      b. PLACING AND CURING OF ALL CONCRETE.
16. ALL CONCRETE ANCHORS SHALL BE MANUFACTURED BY HILTI INC. OF TULSA, OKLAHOMA OR APPROVED EQUAL. ALL ANCHORS SHALL BE APPROVED BY THE INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO).

NOTES:

1. FOR STRUCTURAL NOTES SEE THIS DWG.

0 1
SCALE IN FEET
TYP. UNLESS NOTED

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ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	CY

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

STEEL DETAILS SHEET 1

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S.MARTINEZ

P.PANICALI B.YOSTPILLE

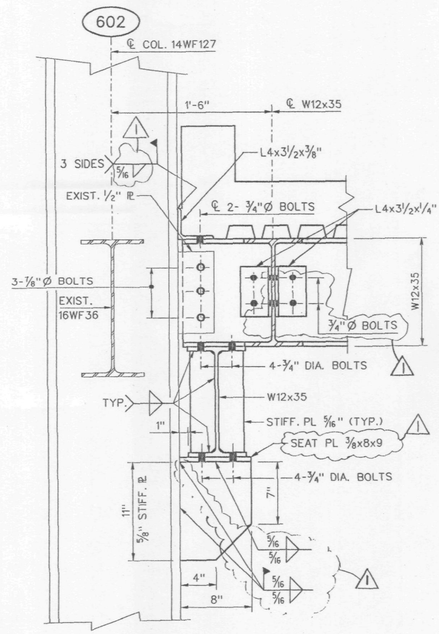
Designed by Drawn by Checked by

12/4/98

Date

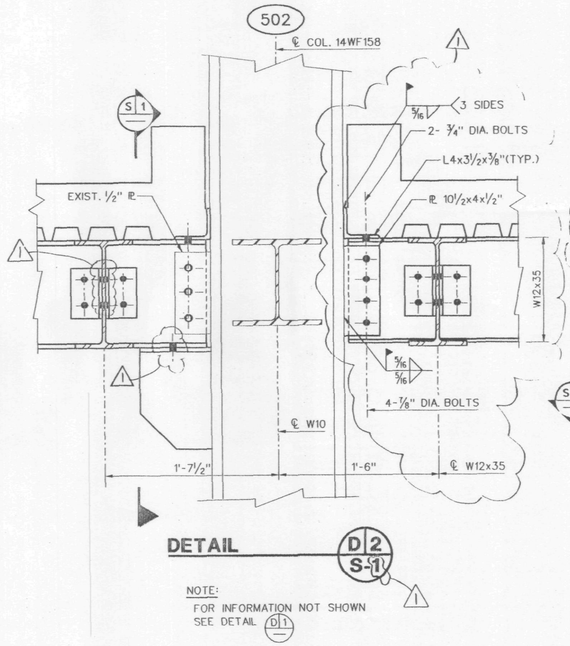
WTC-810.071 Contract Number

S-4 Drawing Number



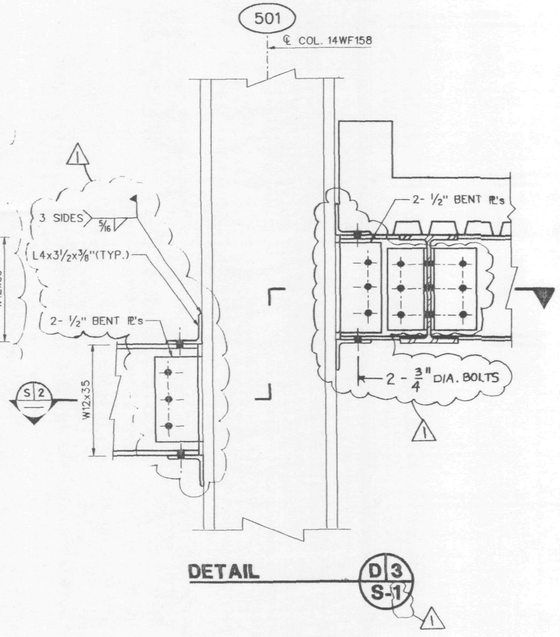
DETAIL D/1 S-1

NOTE: WELDED BRACKET CONNECTION IS TYPICAL FOR COLUMNS 502, 503, 601, 602 & 603.

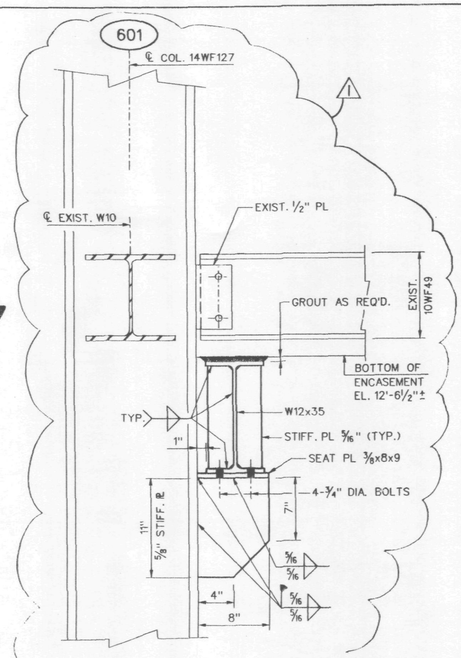


DETAIL D/2 S-1

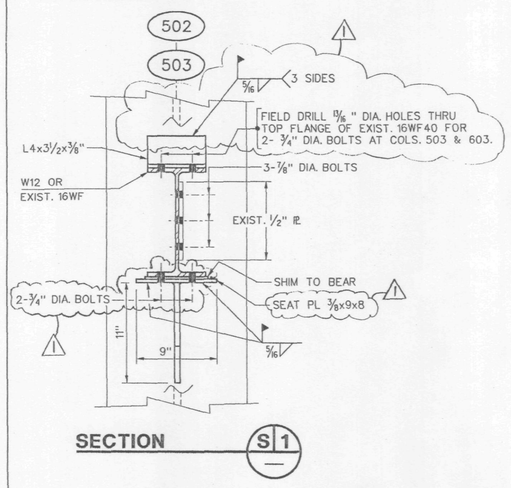
NOTE: FOR INFORMATION NOT SHOWN SEE DETAIL D/1



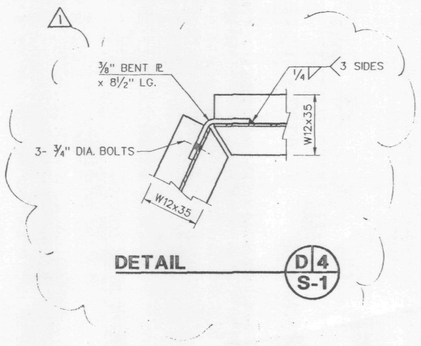
DETAIL D/3 S-1



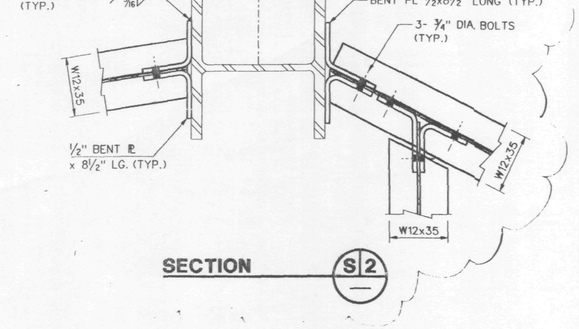
SECTION S/4 S-1



SECTION S/1 —



DETAIL D/4 S-1



SECTION S/2 —

NOTES:

1. FOR STRUCTURAL NOTES SEE DWG. S-4.

0
SCALE IN FEET
TYPICAL UNLESS NOTED

Sheet Of

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY C.Y. CHU
ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	CY

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

STEEL DETAILS SHEET 2

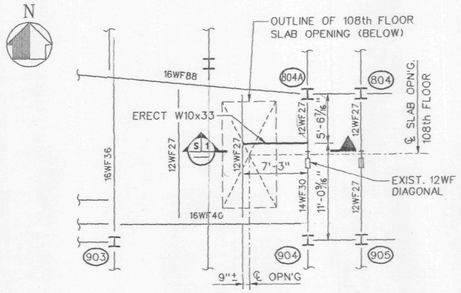
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	Checked by
P.PANICALI	S.MARTINEZ	B.YOSTPILLE

12/4/98
Date

WTC-810.071 — Contract Number

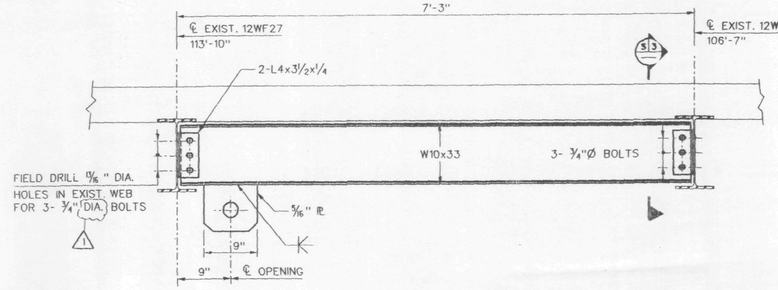
S-5 — Drawing Number



PART- PLAN 109th FLOOR

0 8 16
SCALE IN FEET

1/8"

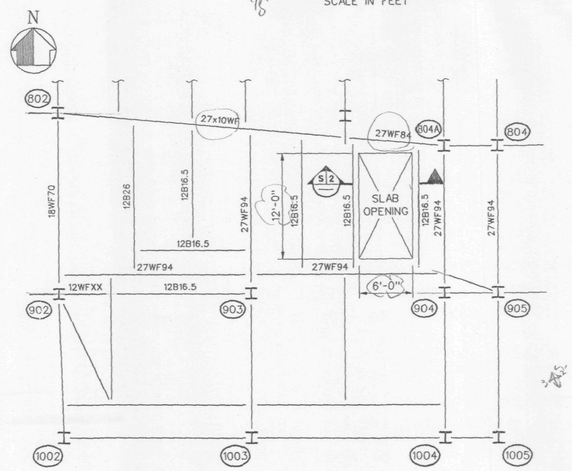


SECTION S1

EQUIPMENT HOISTING BEAM

0 1 2
SCALE IN FEET

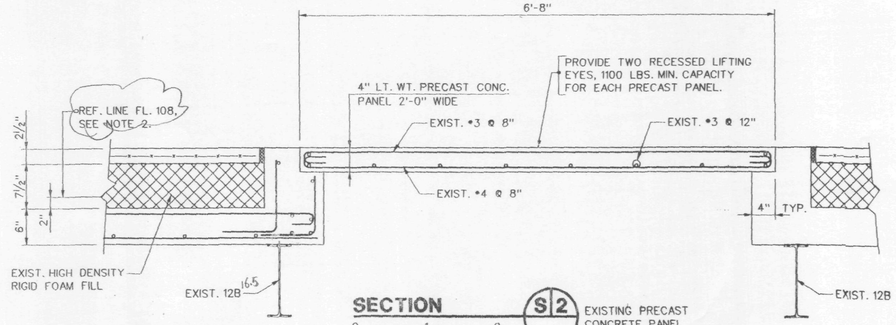
1 NOTE: REMOVE EXISTING FIREPROOFING TO INSTALL HOISTING BEAM AND REPLACE IN KIND.



PART- PLAN 108th FLOOR

0 8 16
SCALE IN FEET

1/8"



SECTION S2

EXISTING PRECAST CONCRETE PANEL

0 1 2
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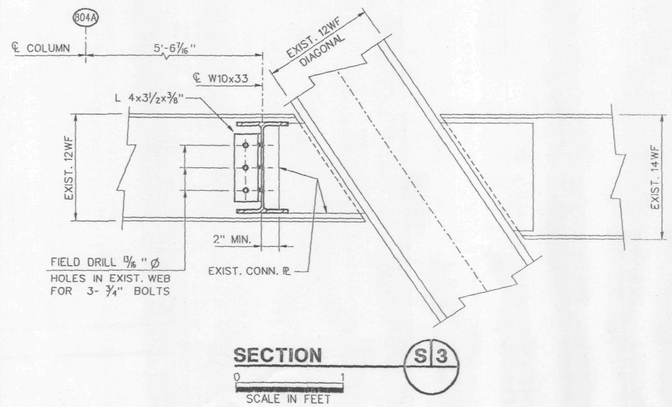


SECTION S3

0 1
SCALE IN FEET

EQUIPMENT TRANSPORT NOTES:

1. FOR EQUIPMENT TRANSPORT ROUTE ON THE 108th FLOOR SEE ELECTRICAL DRAWINGS.
2. THE ALLOWABLE FLOOR LIVE LOAD ALONG THE 108th FLOOR TRANSPORT ROUTE IS 75 p.s.f. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A TIMBER CRIBBING RUNWAY DESIGN OR OTHER LOAD DISTRIBUTION SCHEME SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR REVIEW.
3. COPIES OF ORIGINAL STRUCTURAL DESIGN DRAWINGS AND DETAIL SHEETS FOR THE 108th FLOOR ARE AVAILABLE FROM THE ENGINEER.

NOTES:

1. FOR STRUCTURAL NOTES SEE DWG. S-4.
2. REFERENCE LINE EQUALS TOP OF FINISH FLOOR 108th EL. 1631'-10".

Sheet Of

THE PORT AUTHORITY OF NY & NJ

ORIGINAL SIGNED BY C.Y. CHU
ENGINEERING PROGRAM MANAGER, WORLD TRADE

CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	CY

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL
Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

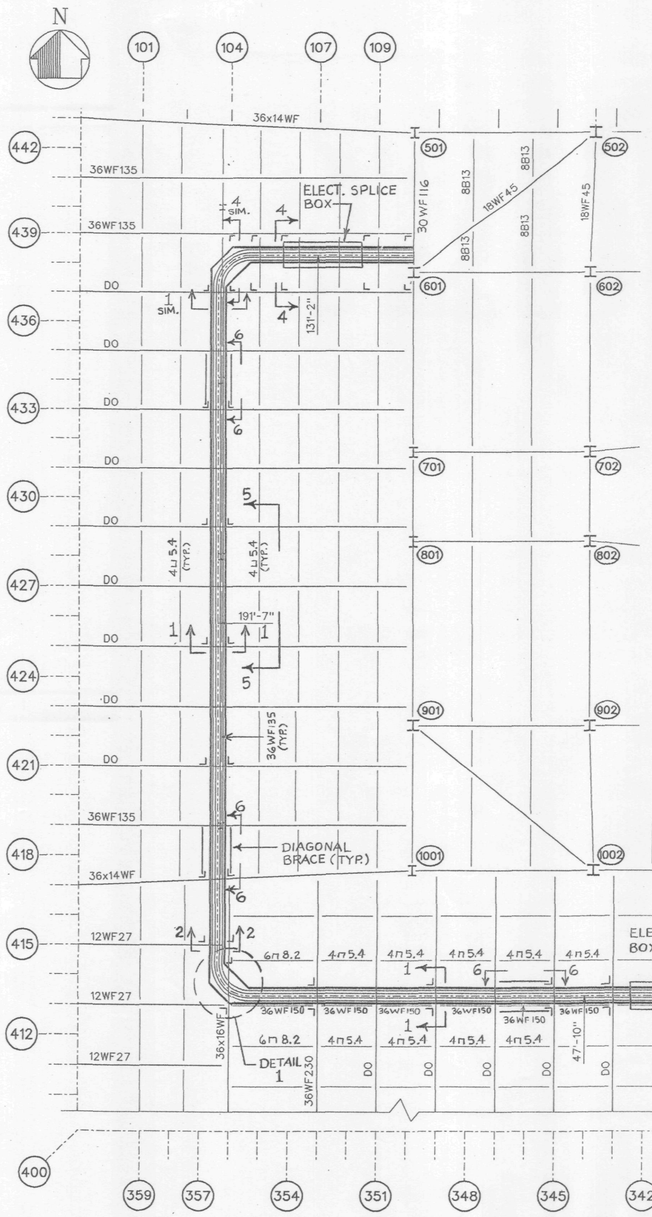
EQUIPMENT HOISTING DETAILS

This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

S.MARTINEZ
P.PANICALI B.YOSTPILLE
Designed by Drawn by Checked by

12/4/98
Date

WTC-810.071 S-6
Contract Number Drawing Number

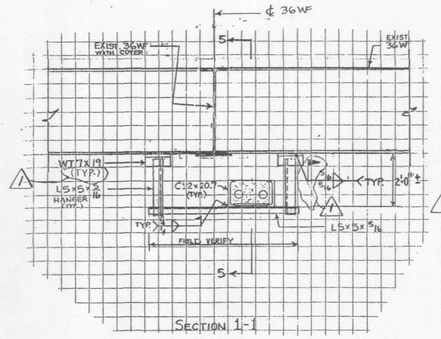


13.8 KV CONDUIT RUN SUSPENDED FROM 110th FLOOR FRAMING

0 8 16
SCALE IN FEET

LEGEND :

⌋⌊ DENOTES STEEL HANGER



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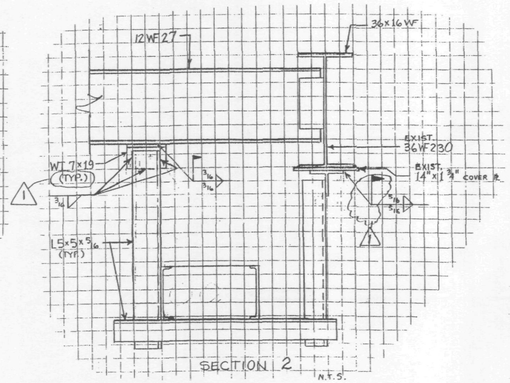
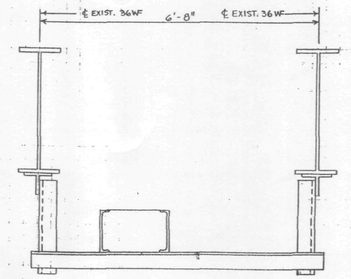


SECTION 2

N.T.S.



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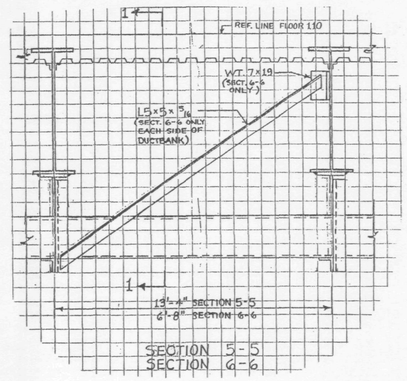
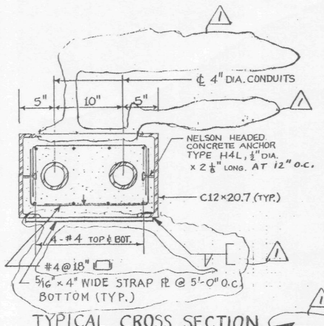
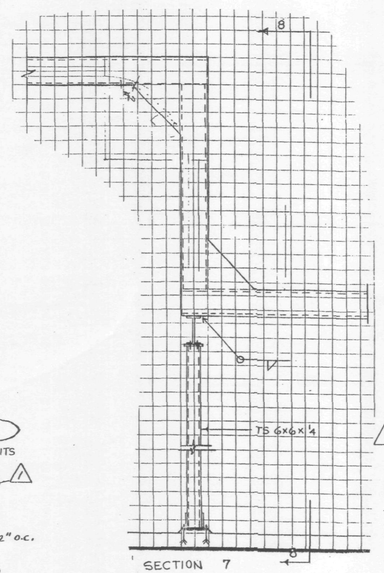


SECTION 5-5
SECTION 6-6



TYPICAL CROSS SECTION



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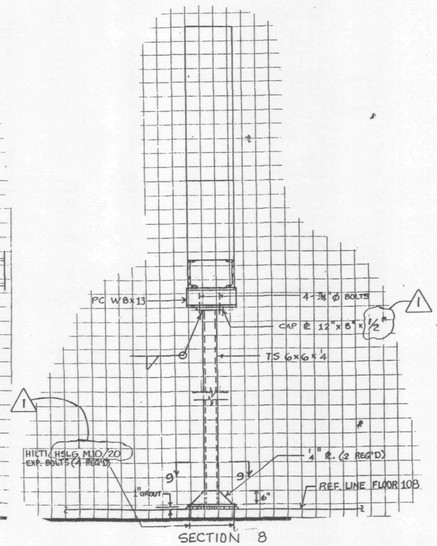

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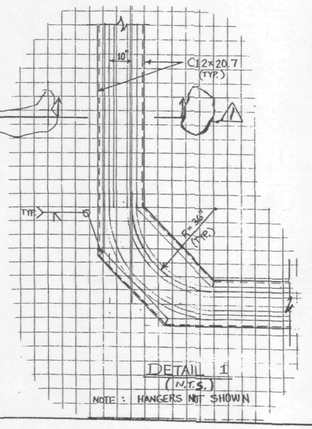
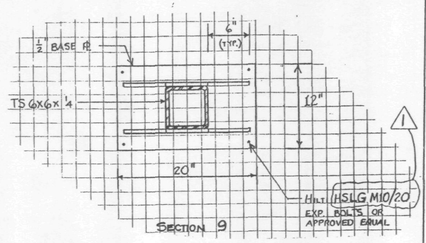


DETAIL 1
(N.T.S.)
NOTE : HANGERS NOT SHOWN



SECTION 9

NOTES:

1. FOR STRUCTURAL NOTES SEE DWG. S-4.
2. DETAILS FOR SUPPORTS AT ELECT. SPLICE BOXES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW.

c:\str\wtc\810071\stage3\98s-7a.r0 Dec. 03, 1998 16:06:18

Sheet 53 Of 66

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER, WORLD TRADE

for CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	CY

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

CONDUIT SUPPORTS PLAN AND SECTIONS

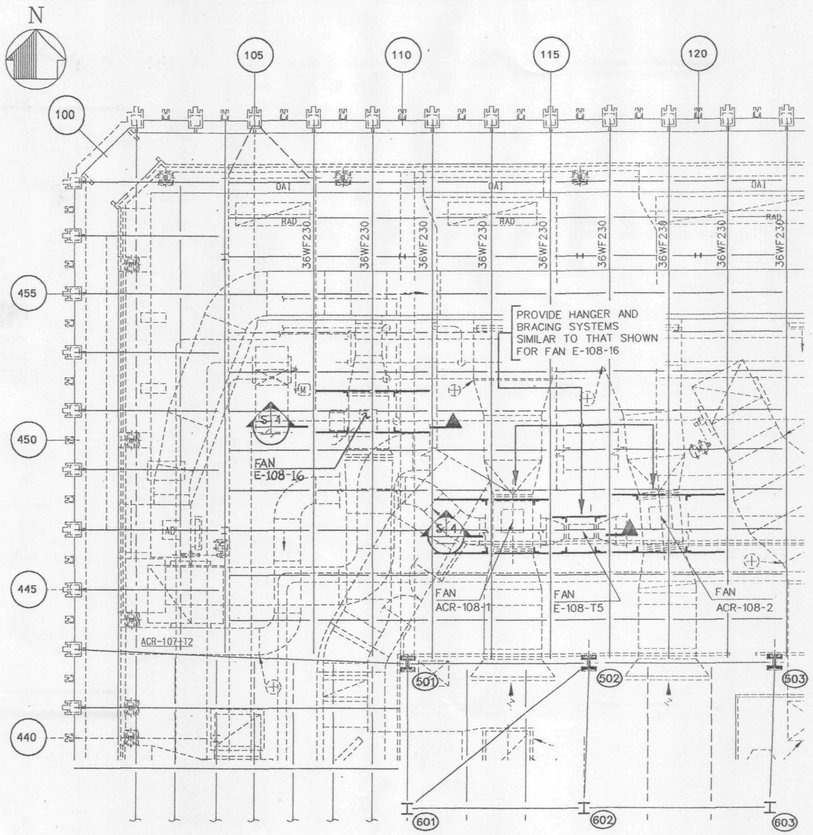
This drawing subject to conditions in contract. All inventions, ideas, designs and methods herein are reserved to Port Authority and may not be used without its written consent.

Designed by	Drawn by	Checked by
P.PANICALI	S.MARTINEZ	B.YOSTPILLE

12/4/98
Date

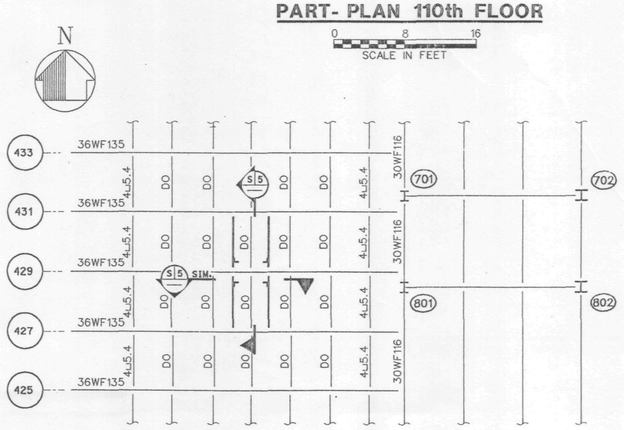
WTC-810.071 Contract Number

S-7 Drawing Number



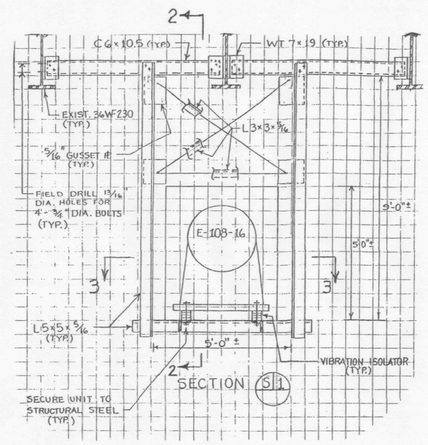
PART- PLAN 110th FLOOR

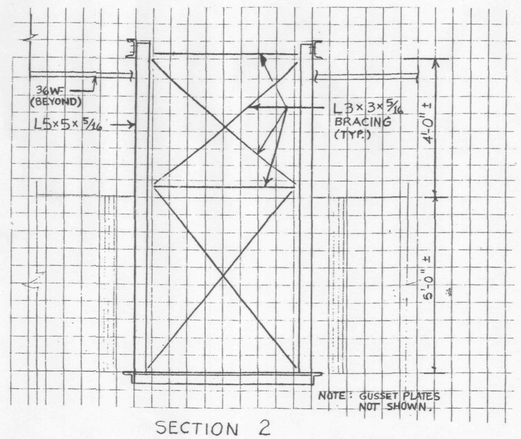
0 8 16
SCALE IN FEET



PART- PLAN 110th FLOOR

0 8 16
SCALE IN FEET





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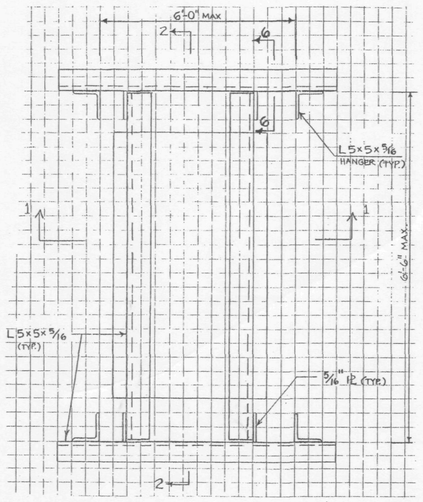

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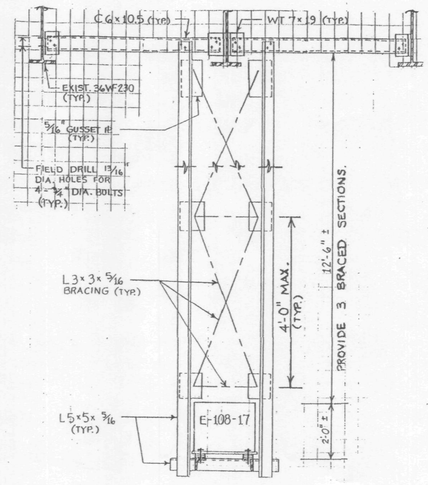

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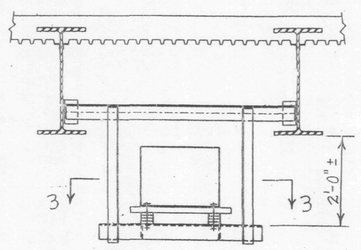

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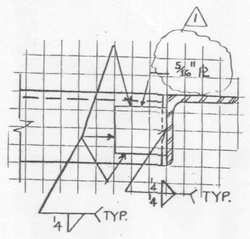

SECTION 6

NOTES:

1. FOR STRUCTURAL NOTES SEE DRAWING S-4.
2. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL FOR ALL STRUCTURAL STEEL WITH DIMENSIONS, ELEVATIONS AND CONNECTION DETAILS INDICATED.
3. THE CONTRACTOR SHALL SUBMIT VENDOR SHOP DRAWINGS FOR APPROVAL INDICATING DETAIL FOR SECURING MECHANICAL EQUIPMENT TO STRUCTURAL STEEL.

Sheet 54 Of 150.508 150.108

THE PORT AUTHORITY OF NY & NJ

ENGINEERING PROGRAM MANAGER, WORLD TRADE
For CHIEF STRUCTURAL ENGINEER

No.	Date	Revision	Approved
1		P.A.C.C.	

ENGINEERING DEPARTMENT

WORLD TRADE CENTER

STRUCTURAL

Title

ADDITIONAL SUBSTATION, SS-108A, ON THE 108th FLOOR AT ONE WTC

MECHANICAL EQUIPMENT SUPPORTS PLAN AND SECTIONS

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Designed by	Drawn by	Checked by
P.PANICALI	S.MARTINEZ	B.YOSTPILLE

12/4/98
Date

WTC-810.071 Contract Number

S-8 Drawing Number